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ABSTRACT

Presented in two reports, this study on reading comprehension investigated whether expository passages with adjacent-to-text activities facilitate the learning of reading comprehension skills at the same time that they improve comprehension of text content, and whether written feedback increases the effectiveness of adjacent-to-text activities. Good, average, and poor readers in a combination fifth-sixth grade classroom were randomly assigned to participate in adjacent-to-text activities, adjacent-to-text activities with the use of an answer key, or reading only the text (control). Activities were designed to develop the Level E Skills identified for the "Wisconsin Design for Reading Skill Development." This second report contains the following six appendixes: the environmental reader called "Life in the Ecosystem," used in the study, the adjacent-to-text activities for each unit, a list that classifies each activity according to the skills and objectives of the Level E test, the answer keys, the content comprehension tests, and directions for the students participating in the treatment groups. (MAI)

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Technical Report No. 458
Part 2 of 2 Parts

THE EFFECTS OF ADJACENT-TO-TEXT ACTICITIES ON THE DEVELOPMENT OF READING COMPREHENSION SKILLS AND ON THE COMPREHENSION OF TEXT CONTENT

by

Eve B. Wilkie

Report from the Project on
Studies in Reading, Language, and Communication

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Center for Individualized Schooling
The University of Wisconsin
Madison, Wisconsin

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THE EFFECTS OF ADJACENT-TO-TEXT ACTIVITIES ON THE DEVELOPMENT OF READING COMPREHENSION SKILLS AND ON THE COMPREHENSION OF TEXT CONTENT

Eve B. Wilkie

Under the Supervision of Professor Wayne Otto

ABSTRACT

The major purpose of this study was to determine whether a set of expository passages designed with adjacent-to-text activities (a type of adjunct aid) would facilitate the learning of reading comprehension skills concurrent with improving the comprehension of the text content. A second purpose was to determine whether written feedback would increase the effectiveness of adjacent-to-text activities. Other variables examined in testing the effectiveness of the technique were reading ability, prior knowledge, and skill application without the assistance of adjacent-to-text activities.

Good, average, and poor readers in a combination fifth-sixth grade classroom were randomly assigned to one of three groups. The treatment materials were designed by the investigator and include expository passages, adjacent-to-text activities, and answer keys to accompany the activities. The activities were designed to develop the Level E skills identified for the Wisconsin Design for Reading Skill Development: Comprehension (1977). Each activity was placed next to relevant text in a passage, indicated by a line marker in the text margin and a number corresponding to the number of the activity. Activities direct readers to read a short explanation of a specific skill, draw a picture

to enhance or demonstrate understanding of a skill applied in text, or questions. During the 14.5 hours spent in treatment sessions, one group (ACTIVITIES) used adjacent-to-text activities while reading the text, a second group (FEEDBACK) checked their responses to the adjacent-to-text activities with answer keys, and a third, or control group (READ) read the text but did not receive adjacent-to-text activities. Upon the completion of each of the four sections of the treatment materials the students were administered an experimenter designed multiple choice test of text content comprehension. A test of skill development was administered during the final three days. This test consisted of four selected tests of the Level E, Wisconsin Tests of Reading Skill Development: Comprehension (1977), forms P and Q.

Results of analysis of variance of students' correct responses on the test of skill development indicated that there was no significant difference between the average mean score of the two treatment groups (ACTIVITIES and FEEDBACK) and the mean score of the READ control group. From an analysis of covariance, there was a significant difference ($p < .0535$) between the average mean score of the two treatment groups and the control group on the measure of text content comprehension in the predicted direction favoring the treatment groups. There were no significant differences in the mean scores of the ACTIVITIES and FEEDBACK groups on either the measure of skill development or on the measure of text content comprehension. Mean percentages of correct responses on the measures of skill development indicated that the use of adjacent-to-text activities with or without feedback was no better or worse for good or for poor readers. However, good readers who used adjacent-to-text activities without feedback were superior to good readers in the other two groups on the measure of text content comprehension. The text comprehension scores of readers with above and below the mean scores on a measure of prior knowledge who used adjacent-to-text activities were superior to those in the control group. There was no evidence of the application of skills to incidental text without the direction of adjacent-to-text activities.

The major conclusion from the study was that although there was no evidence of skill development, the significant result of the comparison of group means on the measure of text content comprehension suggests that the adjacent-to-text activities appear to function to direct readers' attention to relevant text inducing more active and thorough text processing. For this reason, research on the feasibility of the use of an adjunct aid format to improve readers' skills should continue.

Wayne Otto

APPENDIX A

ENVIRONMENTAL READER

Living Environments:

Animals, Plants and People

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LIFE IN ECOSYSTEMS

INTRODUCTION

Life in Ecosystems

Every living thing on earth lives in an environment. Your environment is the place where you live and all the things around you. There are many different kinds of environments, and different people, animals, and plants live in each of them. New York City is a big city environment. The farmland of Iowa is an agricultural environment. The scorpion and the lizard live in a desert environment. A frog lives in a pond environment.

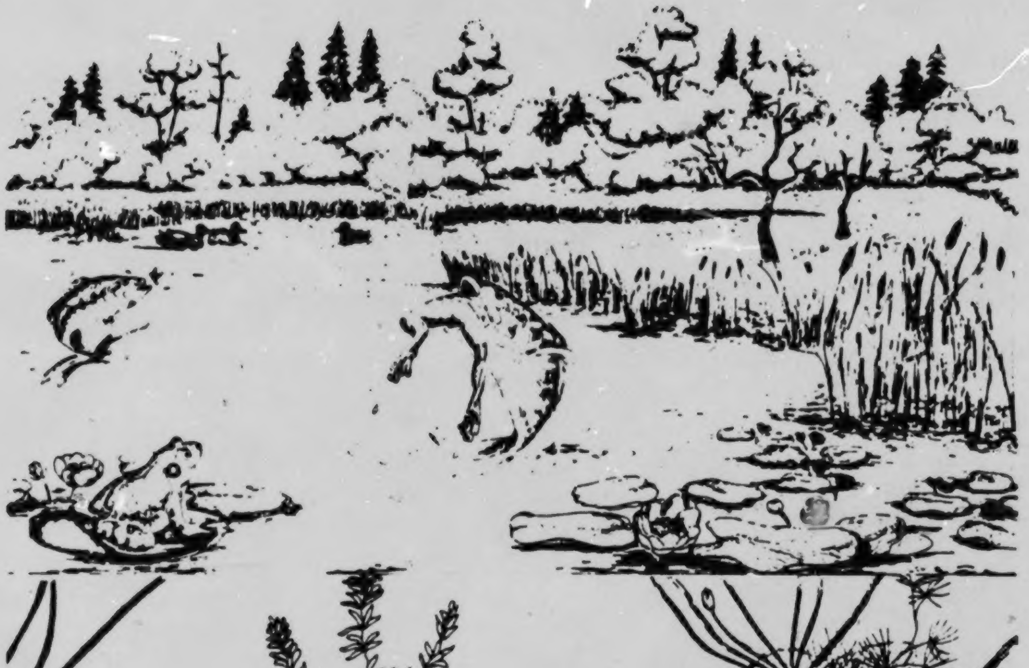
Much of what you do is because of your environment. You wear warm clothes if your environment is cold. You eat a lot of apples if many apple trees grow where you live. You watch television if a television is in your environment. When you do these things, you are adapting to your environment. To adapt to an environment means to fit into it. People, animals, and plants must adapt to their environments to stay alive.

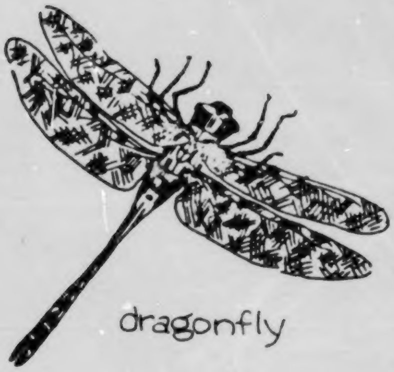
One way all living things adapt to their environment is by being food for each other. For example, plants make their food from the sun's energy. Then many animals eat the plants. Many of the animals that eat the plants are then eaten by other animals. This is called a food chain. All people, animals, and plants are parts of many food chains.

An environment and everything in it, such as food chains, weather, and land, is called an ecosystem. Things in an ecosystem should not be separated. If something happens to one part of an ecosystem, other parts may be hurt. If all the trees in an ecosystem are cut down, many animals would either die or have to move. Insects that eat wood may have nothing to eat and die. Birds that eat these insects will have to leave the area or die. Many food chains will change. The whole ecosystem will change.

In this reader you will learn about different environments, ecosystems, and food chains. Then you will look at human beings as part of different ecosystems. You will see whether they adapt to or change these environments.

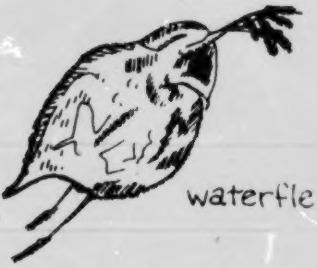
A Pond Ecosystem





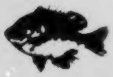
dragonfly

Make believe you are walking through
the woods. You follow a stream that
flows into a small pond. The pond's
shores are thick with plants. There is
an opening among the trees, and the land 1
there is a bit higher and dryer. You 2
sit on a grassy bank and look at the
cattails, bushes, ferns, and mosses
growing under the trees. In the water,
you can see pond lilies and other plants.
Some of these plants are tiny green and
blue-green algae.



waterflea

Great numbers of animals live in the
pond with the plants. You are able to
see many of the smaller animals--may flies,
water beetles, dragonflies, and water
fleas. A beetle dashes to the surface of 3
the water and takes a breath. Snails
creep through the mats of algae.



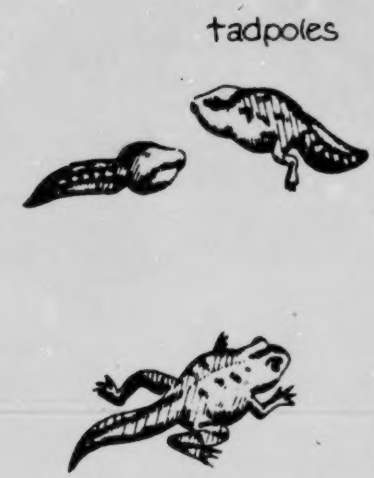
bluegill

bass

water snake

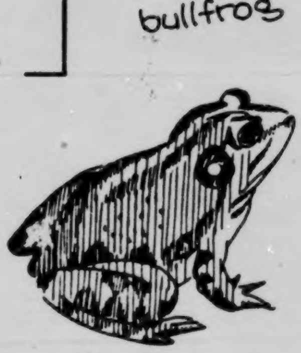
The large animals in the pond are
the most noticeable, of course. You see
fish called bluegills swimming among
the plants near the pond's surface and 4
a sunfish floating over its bright 5
sand nest. A large bass startles you
as it jumps out of the water. A water
snake slides along near the shore.

Frogs watch you as they sit on lily pads,
and a turtle sleeps in the sun on a 5
nearby rock.



The surface of the pond is almost
completely still. In the shadows, a
tadpole wiggles its tail in the water.
Its parents laid their eggs in the pond
on a warm spring evening. The little
tadpole is only a few weeks old.

Since hatching, the tadpole has 6
lived on algae that grow in the water.
The tadpole receives energy from the
algae it eats, and a great deal of that
energy is used to find and eat food. 7
Even so, finding and eating food does not
use up all of the tadpole's energy.
Much of its energy is used for growing.
Already, two little legs are forming
near the tail. Soon front legs will
grow, and the tadpole's tail will seem
to grow smaller. In a few more weeks,
the tadpole will become a fullgrown
frog.



The little tadpole swims close to
the shore. Bending its body, it thrashes
its tail sharply in the water. This 8 9
movement turns it from the shallow toward
the deeper water, where it can hunt for
green algae to eat. The stillness of

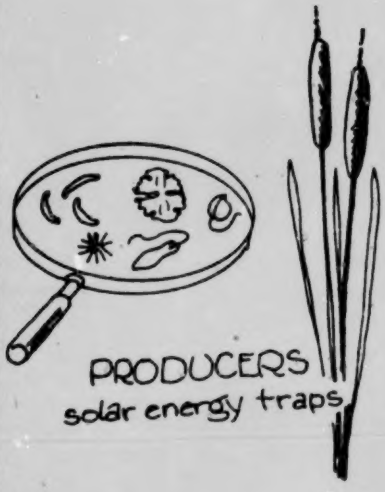
the pond's surface is broken by the
tadpole's movement. Little waves
ripple across the water and catch the
eye of a large bluegill. The bluegill, 8
with a few sharp thrusts of its tail,
closes in on the tadpole. Its open
mouth closes swiftly about the tadpole,
and the tadpole soon dies. 9

The bluegill stops to turn the
tadpole's body so that it can be
eaten headfirst. But before the dead
tadpole can be swallowed, the bluegill's
side is torn open. The sharp beak of
a large bird finds its mark. A great
blue heron has found its breakfast.

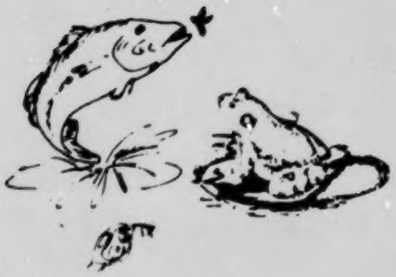
The heron lifts its head from
the water and looks around the pond.
The bluegill killed the tadpole for
food. Now, the heron has killed the
bluegill for the same reason. Headfirst,
the bluegill disappears down the 10
throat of the heron. The heron pushes
hard against the mud of the pond's
edge and rises into the air with new
energy. Wings flapping against the
morning air, it flies to the other 11
end of the pond to find more to eat.

Life will go on for the heron, at least for the moment.

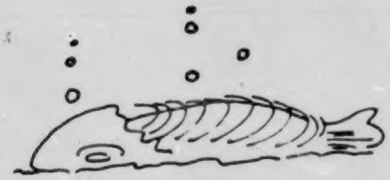
As you can see, life for the plants and animals in the pond means finding other plants and animals for food. Nothing can live without the energy from food. How do living things get the energy that they need? How does one living thing pass energy along to others when it is eaten?



The energy that comes from food
starts with the sun. Green plants
produce, or make, their food from the 12
sun's energy. These green plants are
called producers. Producers have a 13
green substance called chlorophyll.
Chlorophyll makes food by working with
three other things: light energy, carbon 14
dioxide, and water. Light energy from
the sun is trapped. Carbon dioxide is
taken from the air. Water is taken in
through the roots. When these things
come together, they change into food
for the plant. The plant then becomes
food for insects and larger animals.
Green plants, the producers, range in
size from tiny algae to giant trees.



CONSUMERS
eaters of the energy
trappers (and each other)



DECOMPOSERS
eaters of wastes
and the dead

All other living things depend on
food-producing plants. None of the
animals can make food from the sun's
energy. To live, they have to take
energy from others. For this reason,
they are called consumers. Many animals, 15
such as the tadpole, feed directly on
green plants. Other consumers, such
as the heron, eat animals that have eaten
green plants. Humans eat both green
plants and animals for energy.

Other consumers are called decomposers.
Earthworms, crabs, and snails are examples
of decomposers. Tiny molds and bacteria 16 19
are too. Decomposers get their food
energy by breaking down the wastes and
dead bodies of plants and animals. Their
eating is called decay. This decay
becomes minerals and other things which 17
enrich the soil. Plants grow better in
the enriched soil. Decay also gives out
heat and carbon dioxide. The plants use
the carbon dioxide to help make their
food.

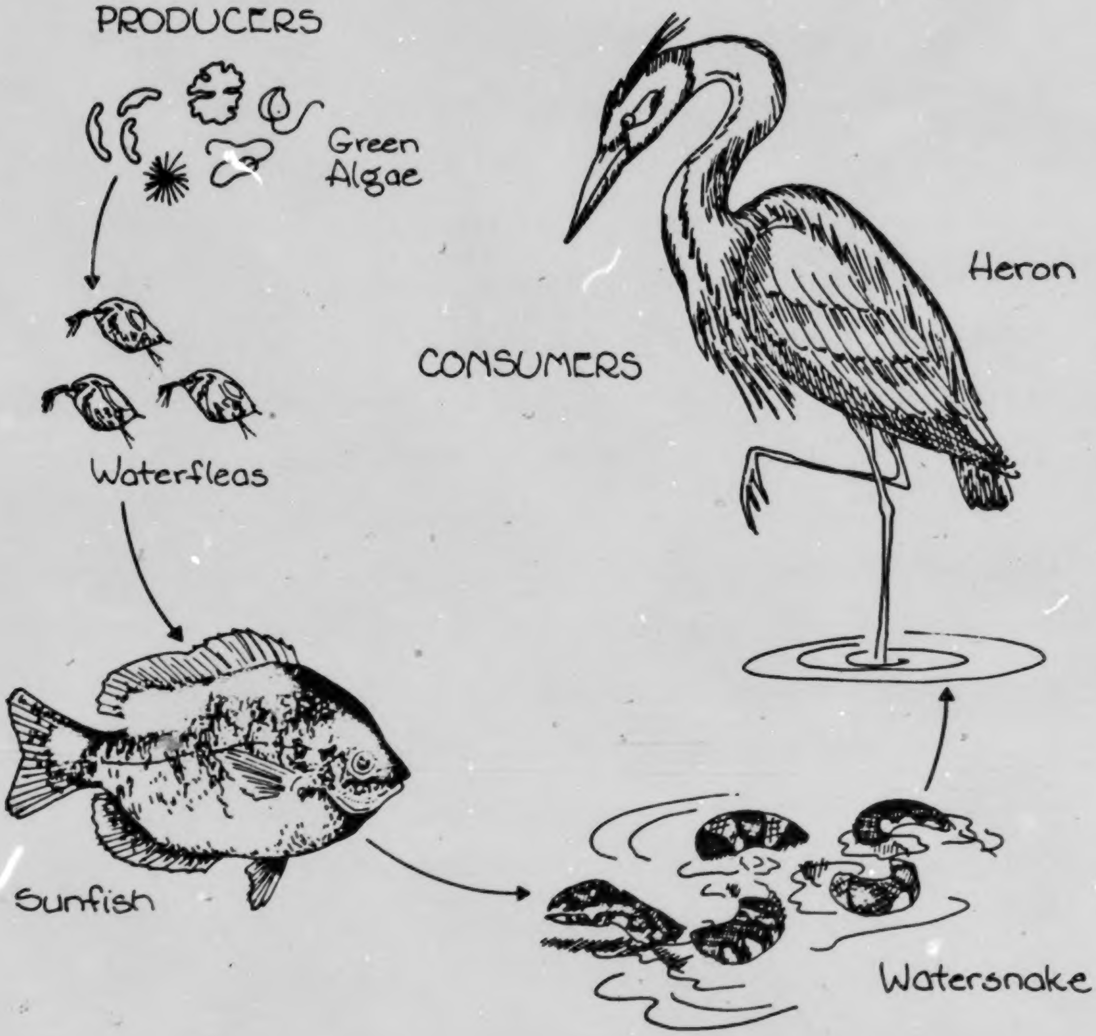
Most decomposers are very small,
such as bacteria. Bread mold is a kind
of bacteria because it decomposes the

bread. The termite is a decomposer because it decomposes wood.
If it weren't for the decomposers, the earth would be completely 18 19
covered with dead plant and animal bodies! Life as you know
it would not be possible.

Consumer animals that kill other animals before or during 20
the process of eating them are called predators. Many living
things are predators. You probably think first of animals such
as lions and snakes as predators. A bluebird, however, is
also a predator when it catches and eats a caterpillar. A
swallow is a predator when it catches an insect. A bluegill
is a predator when it eats a tadpole. And a heron is a predator
when it eats a bluegill. You are a predator when you eat the 21
fish you catch! The animals that are eaten are called prey.

The story of the tadpole, or the bluegill, and the heron
shows how energy is passed along the food chain. The food
chain is a series of steps of passing energy, of eating and
being eaten. The tadpole eats the algae, the bluegill eats 22
the tadpole, and the heron eats the bluegill. When the heron
dies, it will probably be decomposed by insects and bacteria.
Its decomposed remains then enrich the soil. The enriched soil
helps plants to grow, and the food chain goes on.

This is another example of how energy moves through a pond. It is another food chain.


PRODUCERS
Green Algae
Waterfleas
CONSUMERS
Heron
Sunfish
Watersnake

Tiny green algae produce food. The algae are eaten by water fleas that use the food energy produced by the algae. The sunfish eat the water fleas, the water snakes eat the sunfish, and the herons eat the water snakes. Food energy passes from living thing to living thing. Each plant and animal acts as a link in a chain, keeping the energy passing along in an orderly way. 23

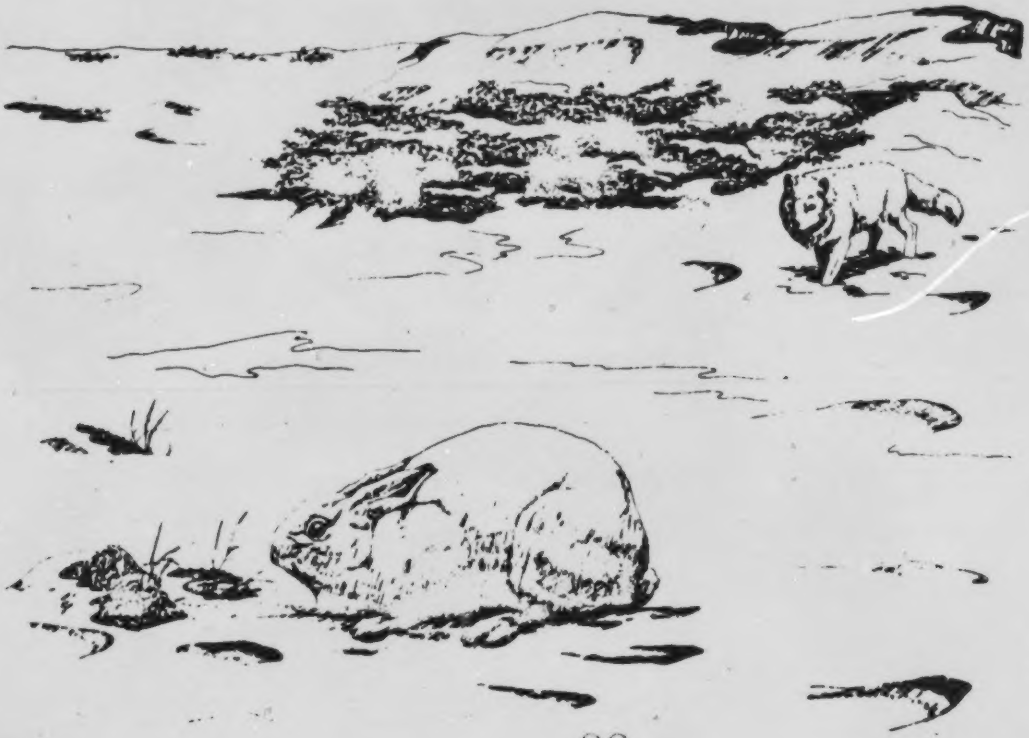
Is the food chain complete? No, something is missing. The whole chain isn't shown. At some time, the heron will die or be killed. Then its body will be decomposed. The decomposers set matter like carbon dioxide and heat free. These are used by the algae to make more food. Then the circle of the food chain is completed. All of the links are held together. 24

If you ate fish caught in this pond, you would be a consumer in the food chain. Your body would use the energy from the fish. It is very easy for humans to break food chains in the pond. If humans stocked the pond with another type of fish, there might not be enough food for bluegills or sunfish, and they would die. Something like insect spray could poison the water fleas. There are many ways to upset or break food chains.

A pond, like a forest or a desert, can be thoughtof as an ecosystem. An ecosystem includes a group of living and nonliving things that depend on each other and on their environment. The plants and animals of an ecosystem need each other to live. The earth is one huge ecosystem. Other ecosystems within it are forest, grasslands, and deserts. Ponds, lakes, streams, rivers, seas, and oceans are ecosystems too. A terrarium or aquarium in a classroom is another example of an ecosystem. 25

Every ecosystem has its own special group of plants and animals. Certain plants and animals are suited or adapted to live in certain ecosystems. They pass energy along a certain food chain. The groups of plants and animals that live together give a pond, a lake, a desert, or a forest its own special makeup. 26
Picture a dead, fallen tree in a forest. As the dead tree decays, it is a home for many plants and animals, such as insects, snails, mosses, algae, bacteria, mushrooms, and perhaps ferns. These plants and animals depend on each other for food. So, a separate ecosystem can even be found in a fallen tree.

But what determines why certain food chains, or sets of plants and animals, are found in certain environments? Why are ecosystems different? The two main causes are the climate of the environment and the plants' or animals' ability to adapt to a certain environment. This can be shown by looking at different ecosystems.



Arctic Tundra Ecosystem

One example of an ecosystem is the tundra. A tundra is a 27
flat stretch of land without large trees. The only plants or
animals that can live are those that are designed, or made, to 28
stand very low temperatures and some of the strongest winds on
earth. On this frozen plain, mosses, lichen, and five-inch 29
willow trees grow.

Picture a winter setting on the Arctic tundra. The cold
wind sends ripples across the snow, but no large trees bend. No
pine needles rustle. In this wintry-white world, no living
thing seems to be stirring. This is because many animals of
the tundra are white. It is hard for their predators to see
and catch them.

If you look carefully, you see a collared lemming. This is
a hamsterlike animal that has come out from its burrow. A burrow
is a hole in the ground made by certain animals. It is their
home. Fluffing out its white fur, the lemming sniffs the cold
air. It begins to look for lichen, willow, or moss to eat. At 30
a distance, a large, white fox moves across the snow. The
larger animal hunts smaller animals for food. The small lemming
sees the large fox. It rapidly heads for the safety of its
burrow.

The hungry white fox moves on to find something to eat,
perhaps an Arctic hare. The little lemming then leaves its 31
burrow once again. It does not see the hungry ermine that is
hunting for food. The ermine is long and looks like a white

weasel. First, the larger ermine raises a black-tipped tail
and points its nose. Then it moves toward the lemming. The 31
frightened lemming is eaten before it can bite or scratch.

The fox keeps running until it spots a polar bear. It
follows the powerful animal but keeps a safe distance. The bear
stops to sniff for seals at a breathing hole in the ice. Breaking
the ice with a sharp-clawed paw, the bear widens the hole a
little. Then it waits. When a seal pops up to breathe, the
bear quickly swats it on the head. It then drags the seal's
body up onto the ice to eat. The bear walks away after it is
full and sleepy. 32

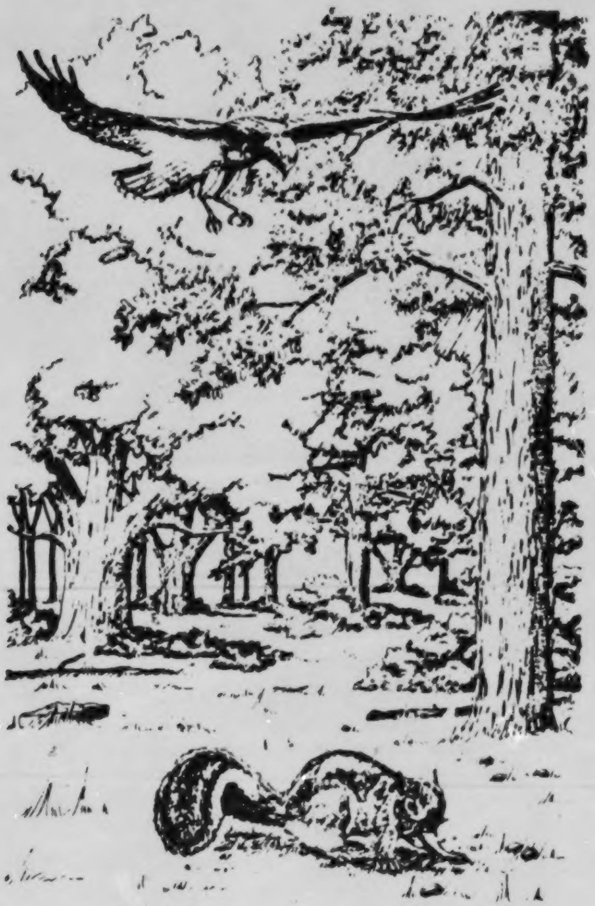
The waiting fox trots out to eat what remains of the seal. At the same time, two ravens dart down to get some of the leftovers. After stuffing itself, the Arctic fox walks off and finds a place to curl up and sleep.

While the fox and the bear sleep, other animals are moving about on the cold tundra. A white-furred Arctic hare sits chewing on a willow twig. Without warning, a snowy owl swoops down and snatches up the hare. The owl moves so quickly that the hare doesn't have a chance to run.

From this, you can see that the plants and animals of the
Arctic tundra ecosystem depend on each other. Without plants 33
like the willow, the hare could not remain on the tundra. Without
the hare, the snowy owl could not live during the dark winter 34
months. This again shows how energy passes from green plants
to consumers. The willow produces food for the hare. Then the
hare becomes food for the snowy owl. This is part of an Arctic

tundra food chain. The hare depends upon the willow for food just as the bear depends upon the seal, and the seal depends upon plants from the sea. 34

Plants and animals of the Artic tundra are adapted to its food chains and climate. They are adapted to the ecosystem. Plants have adapted by living on small amounts of water through long months of freezing weather. Warm white fur and burrows are ways that many of the animals have adapted to the tundra. These things protect the animals from predators and cold, windy weather. 35



Deciduous Forest Ecosystem

The deciduous forest is another kind of ecosystem. Here,
the trees lose their leaves in autumn. Such trees are oak, hickory,
maple, elm, and birch. The climate is mild in a deciduous forest.
This means that there are four seasons. Summer is a time of growth
and winter a time of rest or dormancy. The spring and autumn 37
seasons are times of preparation, or getting ready for summer 36
and winter. The leaves bud in spring and change colors in
autumn. The animals change with the different seasons in the
forest too. The white-tailed deer grow warm, brownish-gray winter

coats. Many forest animals, such as bears, sleep through the 37
winter and are active again in the spring, summer, and autumn.

Tiny ponds and broad rivers provide water in the forest.
Whether swiftly rushing or still, each body of water is the home 38
of different plants and animals.

There are many plants in the forest. Seventy- to eighty-foot
high hickory trees tower over tiny spring flowers, small trees,
and bushes. When the warm spring sun shines, its rays warm
the treetops. The sun also filters down to the undergrowth of 39
smaller plants. The greenery grows upward and outward. Upward
and outward come the many forest feeders. Squirrels and chipmunks
gather acorns and nuts. Insects feast on newly formed leaves.
Nesting birds wait nearby for the chance to snatch up feeding
insects.

The forest plays host to birds from near and far. There are tufted titmice, a downy woodpeckers, red-eyed vireos, owls, and hawks, to name just a few. The woodland has many other animals besides birds. There are always snakes, foxes, raccoons, and opossums. Smaller animals, birds, and eggs are food for larger animals.

As autumn arrives, the forest seems restless. Beautiful
red, orange, gold, and brown leaves deck the trees. When the 40
leaves, nuts and fruits fall, some of the animals begin storing
food for the winter. The quick, gray squirrel stays close to
the trees as it gathers hickory nuts. Danger is always close.
Diving straight into the woods, a red-tailed hawk can easily
catch a careless squirrel.

There are many food chains in the deciduous forest. The
chain with the hickory tree, squirrel, and hawk is just one
example. The hickory tree produces nuts and provides a home for 42
the gray squirrel. The red-tailed hawk nests in the tree or
uses it as a perch while looking for prey. In this case, a 41
gray squirrel may be its dinner.

A Grassland Ecosystem

Now picture yourself on a western prairie as the sun rises
on the green grass. A prairie is a grassland environment, and
there are few trees. Trees do not grow into forests on the
prairie for several reasons. First, there is usually not enough
rain. Another reason is that the sod made by the thick root
systems of the grasses crowds out new growth. The grazing of 43
animals helps, too, because the trees are eaten when they are
very little. Finally, frequent fires have played a big part
in preventing the growth of trees. The prairie has four seasons
like the forest, but the seasons are drier than in a forest. For
this reason, different kinds of plants and animals live on the
prairie.

At sunrise on the open grassland, some animals are beginning
their day. Others are turning in after a busy night. Bending
their large heads, a herd of bison, the American buffalo, eat
grass for breakfast. Their teeth have large grinding surfaces, 44
which make chewing the grass easy. The bison are designed, or
made, to live on the grassland. They are adapted to the
ecosystem.

Some distance away, a herd of pronghorns, deerlike animals, 45
is feeding. Their leader suddenly stops and stares across the
wide prairie. Seeing a moving form in the grass, the pronghorn 46
turns and speeds away. Instantly, the herd follows, disappearing
quickly into the far distance.

Running easily, a coyote, or prairie wolf, comes into view. 47
The coyote hardly glances about as it heads for its den. It has 48
had an active night of hunting gophers, ground squirrels, and
jackrabbits. Its bushy tail is drooping, but its large pointed
ears are listening to the prairie sounds.

The prairie is open to view, wind, and weather. Because of
this, burrowing is a way of life for many grassland animals. A
burrow is snug and dry. It is a perfect place to spend a cold
winter or hide young animals from hungry eyes. Prairie 50 51
dogs--plump, foot-high rodents--sit upright at their burrow 49
entrances. The kit fox also makes its home in a burrow. When
danger nears, the kit fox dives into its burrow for protection.

In the land of burrow-diggers, the black-marked ferret does 52
not bother to dig its own hole. It steals that of its prey. It
behaves like a bandit, and with its black-marked face, it looks
like one. Weasel-shaped and weasel-tempered, it hisses and
spits as it attacks a prairie dog.

Many grassland animals, with their sharp eyes and long ears, are good enemy spotters. Their long legs make them fast runners too. The prairie is a good place to be fast, because no trees get in the way. The smaller animals, like prairie dogs, are not built for speed and must depend on their burrows for

safety. These animals, too, have sharp senses. They dive into
their burrows when their eyes or ears warn them that danger is 53
near.

Predators play their needed role on the grassland by eating
other conusmers. By day or night, the hunters snatch their
prey. From high above, a hawk swoops down to catch a prairie
dog. On the ground, a rattlesnake has another prairie dog in
its jaws. In the grass, the insect called a praying mantis eats 54
a grasshopper. Nearby, a badger is digging its way into the
tunnel of a ground squirrel. In the shadows, a coyote is about
to snatch a jackrabbit. Some distance away, a kit fox attacks
a smaller gopher.

The grassland animals and plants are linked together in many food chains. The bison, prairie dog, and jackrabbit all depend upon the grasses for food. The badger, kit fox, and coyote depend upon the grasseaters for survival. All of these animals are able to live together in the prairie grasslands.

A Desert Ecosystem

You may think that the desert environment is dull, dry,
lifeless stretches of sand and rocks, but the desert is often a
land of beauty. Many different kinds of plants and animals live
there. In some deserts, there are mountains. In others, sand
dunes rise in waves stretching for miles. Sometimes, deep
canyons and narrow gullies are all that are left of raging 55
rivers. One of the seven wonders of the world is a desert
environment--the Grand Canyon.

Little rain falls in deserts except for very short periods each year. Usually, the only season is a dry one. Nights are cool, and days are often very hot. The desert looks white, dry, and still.

Desert waterways usually end up as dry lake beds and dry streams. Small amounts of water, however, can be found in the desert at one place or another. Streams that begin in mountains
often flow some distance across the desert. Then they disapper 56
in the sand. Some lakes manage to last in the desert too. Groundwater, which lies deep below the desert surface in many areas, is protected from drying up in the hot sun.

Imagine a desert ecosystem of southwest America. In the late
afternoon air, several wild, piglike animals, the peccaries, leave 57
their resting place. Grubbing into the ground with their snouts, they dig out cactus roots and stuff themselves. Mesquite trees, almost buried in sand, wave their drooping branches. And cacti tower above the desert like giant candlesticks. Some of these
plants have thick, tough outer layers to keep them from drying 58
out. They are adapted to a dry, hot climate.

At afternoon's end, the desert plants begin to cast long shadows, and animal life begins to stir. At early dusk, the
crawling and creeping animals come out. Swiftly, a small lizard 59 60
darts at an insect. Rattlesnakes join the hunt for evening food. Under a bush, a foot-long lizard, the iguana, raises its head and whips its long tail.

Then the desert birds begin to sing and call. A gila woodpecker hops out and clings to a cactus stem. An ash-throated flycatcher sails off. After rising in swift flight, a purple martin hunts insects. An odd bird with a shaggy crest, long legs, and a very long tail races into view. It is a roadrunner, and it races
across the desert at up to eighteen miles an hour. The roadrunner
jumps on a small rattlesnake and pounds it with its heavy bill. 61
Then the dead snake is swallowed headfirst.

As darkness closes in on the desert, many of the birds 62
sleep. The burrowers come to the surface in the cool night.
Hopping on its kangaroo-like legs, the kangaroo rat sniffs about.
It stops to take a dust bath and then begins to gather seeds for 63
dinner.

From dusk to dawn, the desert is alive with movement. The desert's dryness, hot sun, and blowing sand can't keep plants and animals from living there. The living things in the desert continually seek food and new sources of water. They are linked together in many desert food chains.

So Different, Yet So Much the Same

Tundra, forest, grassland, desert--each of these environments
has different plants and animals making up its ecosystem. The
tundra is much colder than the grassland, forest, or desert. The
grassland and desert get the most sun. The forest gets the most 64
rainfall.

You can compare any of the earth's ecosystems and find many
differences. However, you will also find that they are alike

in many ways. Look at the forest and the desert, as an example. They seem very different, but they are also alike.

Both the forest and the desert have producers that trap energy from the sun. In the desert, the cactus is a producer; in the forest, a hickory tree. Both environments also have consumers that depend on producers for the energy to live and grow. The desert consumers include the iguana and the desert fox. The gray squirrel and the hawk are consumers in the forest. These plants and animals form food chains. They depend on the sun for an endless energy supply and the decomposers for the release of trapped energy.

All ecosystems, regardless of how different they are, have a living and a nonliving part. Climate, soil, and energy from the sun make up the nonliving part. The living part of an ecosystem is made up of producers (green plants), consumers (animals), and decomposers (bacteria and fungi). These parts are all linked together. They work together to form the whole system. 64

Human Beings in Ecosystems

Human beings are a part of the earth ecosystem. As a human being, you are a part of food chains in a certain environment. In many ways, you are just like all other animals because you must depend on plants and other animals to live. 65 You are different from other animals, however, because you have a highly developed brain. The brain has allowed humans to develop culture. Culture includes beliefs, tools, science, language, dress, and other parts of a way of life. 66 The way groups of people adapt to and

change their environment is shown in their culture. In this
book, you will study three different kinds of cultures: a hunting 67
and gathering culture, an agricultural culture, and an industrial
culture.

Hunting and gathering food is the oldest way of living on earth. All humans were once adapted to their environments in this way, and several groups of people in different parts of the world still are. They have very simple tools and live by hunting wild animals and gathering wild fruits, berries, nuts, and roots for food. These people are a part of the natural food chains. They move to wherever they can find food. Their culture shows how they adapt to food chains by hunting and gathering.

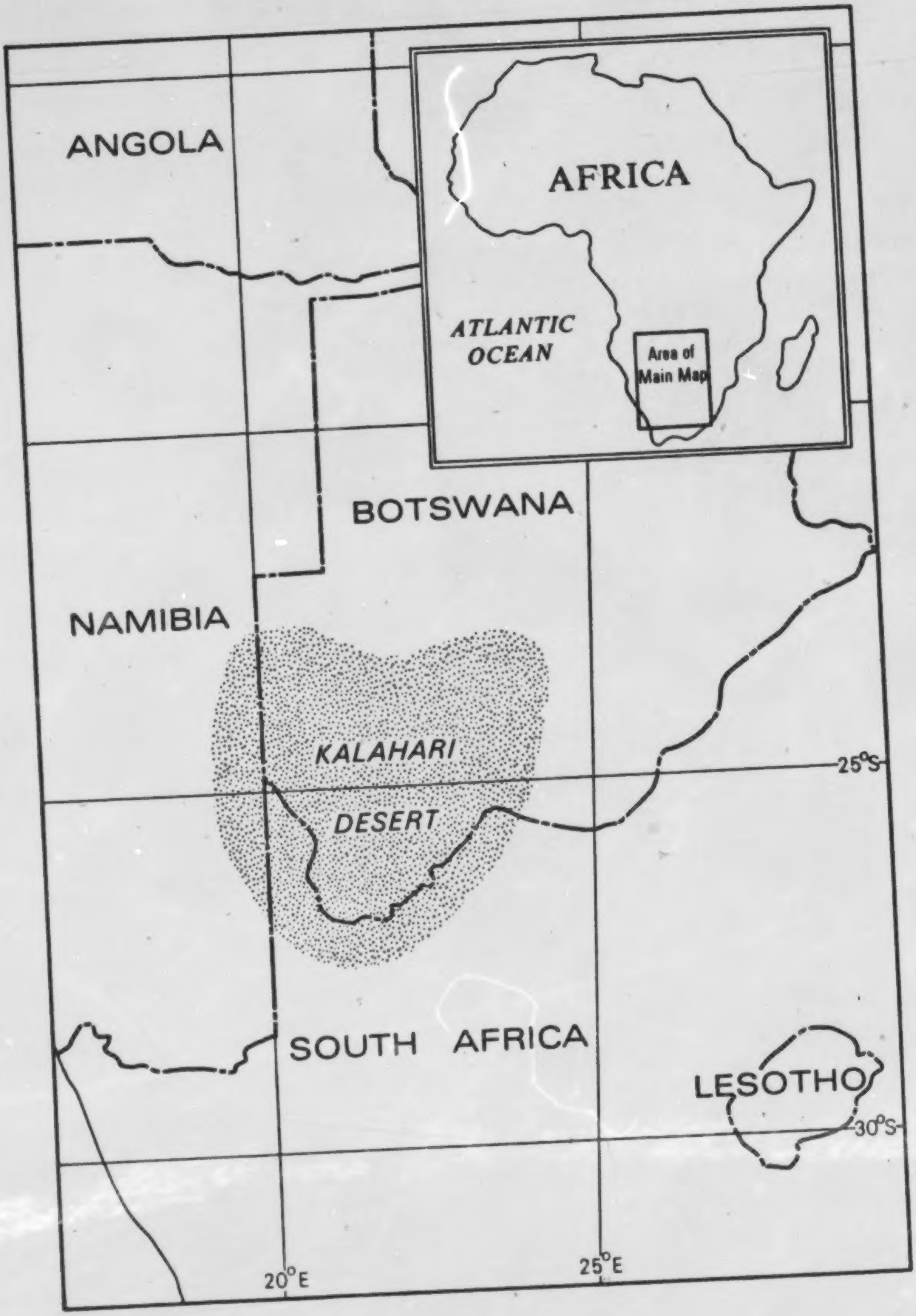
Many groups of people throughout the world depend on
agriculture to live. These people grow crops and raise animals.
They are farmers. Because farmers can grow their own food and 68
store it for later, they do not have to move around in search
of food. They are no longer adapted to the natural food chains.
When people grow crops and raise animals, they make changes in
natural ecosystems. Land is cleared, and wild animals are forced
to move because their homes are destroyed. Food chains are broken.
Agriculture is a way of changing the environment.

In the past, more than enough food was produced by people growing crops and raising animals. This extra food, or surplus, was then traded for things made, gathered, or hunted by people who were not farmers. Over the years, more and more people have not had to find or grow their own food to live. They trade their work for money and buy food. Industry is the use of tools and and machines to make products, such as cars, clothing, air-conditioners, and houses. An industrial culture is one in which people depend upon machines. Many people feel that human beings do not adapt well to the industrial machine environment.

In the many cultures that depend on industry for their way
of life, great demands are made on the natural ecosystems. The
environment has to give up large amounts of coal, iron, and many 68
other ores to make new machines and products. Living and nonliving
parts of the ecosystem are used in an unnatural way. Energy and
resources are used up quickly to make industrial products. Food
chains are broken and unnatural ones put in their place. The
plants and animals cannot adapt quickly enough. Air pollution
and water pollution are also problems when ecosystems are changed
by industry.

Looking at groups living in different ecosystems will help you see how ecosystems work. The next three sections show how human beings adapt to and change ecosystems as hunters-gatherers, agriculturalists, and industrialists.

THE KALAHARI:
A Desert Ecosystem


ANGOLA
AFRICA
ATLANTIC OCEAN
Area of Main Map
BOTSWANA
NAMIBIA
KALAHARI DESERT
25°S
SOUTH AFRICA
LESOTHO
30°S
20°E
25°E

SECTION 2

The Kalahari: A Desert Ecosystem

In southwestern Africa is a great stretch of dry land. Only plants and animals adapted to burning heat in the long summers and biting-cold nights in winter are able to live there. This land is the Kalahari Desert. The Kalahari Desert covers much of Botswana and part of Southwest Africa. These are two nations of southern Africa.

The plants and animals of this desert have adapted to an
environment with little water and temperatures as high as 120 1
degrees. There are no rivers or lakes, but water holes are
located on the edges of the desert.

Few trees shade this desert of flat plains and low dunes, 2
or rolling hills of sand. Every now and then, however, a huge,
two-hundred foot baobob tree is seen. Its great, thick branches 3
reach like stretching arms into the sky. The bark is thick and 4
smooth, and sags in folds toward the bottom of the tree. The
tree is adapted to the hot, dry climate because it is able to
store water in the spongy wood of its huge trunk.

Most of the desert plants, however, are grasses and bushes. 6
Some of the plants store water in large underground roots. Many
rest as seeds until the rainy season when they germinate, or 5
start to grow.

Because plants do grow on the Kalahari Desert, animals that
consume these plants are also able to survive. Antelope and 7
zebras mainly eat the grasses. Insects, such as ants, are also

plant eaters. The plant eaters are food for animal-consuming
predators like lizards, snakes, lions and leopards. Birds are 7
also part of the food chains in the Kalahari desert. Very large
birds called vultures eat animals that are already dead.

Animals, like plants, must have water to survive. Finding
and storing water is the main task in adapting to the desert
environment. Although animals can move around to find water, 8
they need it more often than plants. Animals trying to stay
alive find water in many different ways. Many birds, like the 9
large ostrich, and grass eaters, like the antelope, travel
across the desert to water holes. When times are very dry they 10
often seek water outside the desert.

Much of the need for water is met through food chains.
Some plant eaters, such as insects, eat plants that have water 16
stored in them. And predators, like lions, can sometimes
quench their thirst on the flesh and blood of prey.

Some desert animals seek a drink or store water in 11
surprising places. Lizards and insects often lap dew at daybreak.
Dew is tiny drops of water formed at night when it is cool.
Desert tortoises carry extra water around them. The two sacs
under the tortoise's upper shell fill with extra body water. 12
It is like having two water canteens.

The desert is without rain for about ten months of the
year. A hot, dry wind blows across the desert most of the
time. During the two cool months, June and July, the bushes and 13
grass are covered with frost at dawn. Any water left standing
freezes at night. Days warm slowly to around 80 degrees, but
the cold returns at night.

Rains come at last to the Kalahari in December, January,
and February. At this time, water holes fill up, and small ponds
form. All of the desert life becomes active with the rains.
The grass turns green. New leaves and blossoms appear on bushes.
Flowering plants brightly color the desert. Much of the plant 14
life sprouts from seeds that have rested in wait for moisture.
These plants bud, blossom, and bear their seeds quickly, for the
season is short. The animals of the Kalahari graze on the new, 16
tender plants brought to life by the long awaited rains. In 15
March the drought, or dry times, return.

When the rains stop, the water holes start to dry up. They
become slippery mud and then caked white earth. By June only
little water holes are left. They are deep in the ground and
covered with long grass. These water holes are miles apart, and
travel in the desert is nearly impossible when the water holes
completely dry up in August. A time of waiting begins. All
desert life awaits the rain.

Hunting and Gathering in the Kalahari

The Kalahari Desert is the home of people called Bushmen.
These people once lived on rich grasslands of South Africa.
But in the struggle with cattle-raising peoples for this land, 17
the Bushmen were driven north. They found safety on the
Kalahari, and as a hunting and gathering people, were able to
adapt to the harsh desert conditions.

Unlike most African groups, the Bushmen are rather small. 18
As adults, they are four and one-half to just over five feet
tall. The hot desert sun has darkened their skin to a copper
brown color to protect them from sunburn. Over the years their
skin becomes very wrinkled. The language spoken by these people 19
is very different too. The tongue makes clicking sounds against
the roof of the mouth to make words. The most unusual thing about
the Bushmen is that many of them still live as the earliest
people on earth once did. They are hunters and gatherers, and
few groups today find their food in this way.

Because of the harsh desert conditions, the Bushmen do not 20
plant crops or herd animals. Instead, they gather roots, berries,
and nuts, and hunt animals. They are adapted to and part of the
food chains in the Kalahari. Like other animals and plants, 21
they take only what they need from their environment. The food
chains are not upset or broken. When the water holes in one
place are dry and little food remains, the Bushmen move to a
new place. They have no choice. The food chains are able to 23
renew themselves. In their search for food and water, these 24
people must move a great deal. They do not stay in one spot 22
but migrate. Such people are called nomads. The Bushmen do
not change their environment for their own use. Like the
antelope and the lion, they adapt to a desert environment.

Where food and water can be found, a band of about twenty
Bushmen set up camp. This camp is called a werf. A visitor
could probably walk through the werf without knowing it because 26
the small, cone-shaped houses made of sticks and grass look much

like bushes. These houses, called skerms, give shade during the
day and shelter from the cool winds at night. Near the houses is
a carefully placed row of ostrich eggshells, often decorated 25
with carved designs of zigzags and diamonds, or animal pictures. 26
The eggshells are important because they hold water. Each one
is filled through a hole cut in the shell. The hole is then
stopped up with grass.

Sometimes, no skerms are built at all. A stick may be stuck
into the sand to mark the spot. Places are scooped out of the 27
sand for sleeping. These "sleeping nests," like the skerms,
give protection form chilling winds at night.

Bushmen clothing, like Bushmen housing, is suited to the
climate and the natural environment. A man wears only a leather
breech cloth. It is all the clothing needed in the hot
environment. Over one shoulder, he carries a leather bag. In
this is an ostrich eggshell and things like arrowheads, a skinning 28
knife, a pipe, and tobacco.

A woman wears a small leather apron and a big cape called 29
a karass. The folds in the cape may be used to carry a baby,
food, or firewood. Also tucked into the folds are her jewelry
and makeup. The jewelry is made of ostrich eggshells. Tiny 30
round bits of the shells are strung together on a piece of
sinew or wood. These strands are worn as headbands and
necklaces. Her makeup is face powder made from finely ground
grass seeds. It is kept in a small tortoise shell.

The main task of desert survival is finding food and water.
The Bushmen know the land well. When the water holes dry up and
the Bushmen travel, water must be found. A Bushman can find water
where no one else would think to look. He might walk a few feet 31
to a little bush and pull out a tsama melon. He would make a
hole in the top, mash the insides with a stick, and then drink
the good juice. Other plants may be eaten for their juice. These 32
are the bi and ga roots and the wild cucumber. Another way to
get water is from sip wells. In some places, rain water is
held in the moist sand. The water is three to four feet from
the surface. A Bushman digs into the sand with a reed, which
is a kind of grass with a hollow stem like a drinking straw.
He sucks water through the reed and then stores the water in an
ostrich eggshell. It is hard work, but water is all-important.

The women and children gather fruit and nuts. Meat makes
up only a small part of the food that the Bushmen eat. The
Bushmen cannot always depend on animals like they can on plants.
Over one hundred kinds of plants are gathered for food. These 33
include roots, bulbs, berries, other fruits, nuts, and leafy
greens. The most important of these food plants is the
mongongo nut. The Bushmen eat thousands of pounds of these
nuts each year.

Early each morning, some of the women and children go to
gather plants. The sun is not yet up, but it is already hot
on the Kalahari. Some mornings, they have to walk many miles
over the dry grass before they find anything. A digging stick, 34
usually a tall, pointed branch, is used by the women. With this,

they break the sun-baked earth and free the roots or plants to be gathered. Back at the werf, a stamping block, or shallow wooden bowl, is used to mash seeds and nuts. 34

Early in the morning, the hunters are busy too. They must prepare their arrows before they go. First, the hunters file iron pieces into points for arrowheads. The arrowheads are carefully tied onto split sticks and then smeared with a poison that will kill the animals. This poison is made from bark or roots and the dried insect larvae of the ngoa moth. Sometimes, the venom of the deadly snake, the mamba, is used. The arrows are stuck, points upward, into the sand until the poison dries. The men are now ready for the hunt. 35

The Bushmen usually hunt in pairs. The hunters follow the tracks, or spoor, of animals. There is usually a long walk before a hunter pulls his bow. The first arrow whizzes over the grass and into a big antelope. The wounded animal runs for days, while the hunters follow the spoor. The animal finally falls when the poison from the deadly arrow has crept through its body. The hunters then kill it with a spear. 36

When the hunters bring home the antelope, it means plenty 37
of food. The large game animal is divided and shared with
members of the werf. A long awaited antelope may mean a feast. 38
Everybody is happy. Songs are sung about the hunt, while the men 39
dance. The women also dance but often prefer to watch instead.
The Bushmen dance under the open sky and sing to the stars.
They believe that the stars are hunters too. They say that

the stars chase their game across the sky. For the Bushmen,
hunting is what keeps them alive. They believe that it is the 38
only worthwhile way of living. Their belief in the hunt holds 39
them together and gives them the strength they need to live.

After the feast, some of the antelope meat is cut and dried 40
in the hot sun. It can then be eaten later. The Bushmen do not
waste any part of a dead animal that can possibly be used.
Parts that are not eaten can be used for other things. Pouches,
arrow quivers, and clothing are made from animal skins.

The antelope and other large animals are regularly hunted 41
with poisoned arrows. The Bushmen hunt smaller animals in other
ways. Sometimes they dig into the underground burrows of animals
like the springhares. These animals sleep in long burrows during
the day. The hunter hooks the animal with a metal hook on a long
pole. Then he digs up the soft sand to capture it.

The Bushmen also hunt the ant bear, which lives underground
like the springhare. When the hunters find an underground burrow, 42
they close off the exits. Then they build a fire at the mouth.
When the ant bear tries to escape the smoke, they kill it with
spears and clubs.

Another animal that is hunted for food is the big leopard tortoise. The tortoise weights up to eight pounds. It is easily caught by men, women, or children. The tortoise is baked in the shell and can feed a family of four.

Some animal foods are gathered or caught, not hunted.
Termites, which are like large ants, develop wings during the 44
rainy season and swarm from their nests. At this time, the

Bushmen collect and eat them. Grasshoppers, ants, and ant eggs 44
are other kinds of animals gathered for food.

The Bushmen do not wander across the whole desert alone.
To survive, they live together in small bands. Each band has
its territory, which includes a water hole and vast stretch of
land around it. The people of the band know their territory
well. The hunter knows where game can be found in certain
seasons and times of the day. In dry times, he knows where to
look for sip wells. Remembering where a green plant grew during
the rainy season, a Bushman knows where to look for food later 45 46
on. He finds the dried up leaves of the plant and digs into the
ground for its roots.

The Bushmen survive by knowing their territory. Territory is
important in hunting and gathering cultures. Territory makes it
possible for desert people to hunt and gather without destroying
the natural food chains of one area. It creates order. People
who are not part of the band must ask permission to enter the
band's territory. When a band moves, it is to another place
in its territory.

Territory, like bows, arrows, skerms, eggshell beads, and
ways to find water are examples of the culture of these
hunter-gatherers. Their culture is what the Bushmen do to adapt
to their environment. You have seen how the Bushmen get food
energy as part of a desert ecosystem. But culture is not only 47
the things people do and have. It is also what people think
and believe. The Bushmen have beliefs that fit their way of
life. Their beliefs are told in songs, dances, and stories.
A group's beliefs explain things about their environment.

One story often told by the Bushmen explains how the moon becomes smaller and smaller each month and then full again.

The Mighty Hunter and the Moon

The mighty sun rules the land all day. It brings
heat and life and death to earth. But at night, the
moon shines brightly, bringing comfort to people.
The sun cannot stay still in the sky and shine at
night with the moon. The mighty sun hunts the moon. 48
It tries to kill the moon with flaming arrows. Every
day, it chases the moon and shoots off a slice of the
moon. The moon grows thinner and thinner but does not
die. It hides for a while to heal. Then it returns
as a full moon. The angry sun sees it and begins to
chase the moon again. This happens over and over.
It is why the moon changes.

The story about the sun and the moon explains an event in a special way. It shows that Bushmen see the sun as a hunter, a taker of life. The moon is a friend of life. The moon is able to withstand the sun's fiery attack. The Bushmen, too, survive the hot sun.

Many of the Bushmen's stories are about animals of the
Kalahari ecosystem. The stories show that Bushmen feel a 49
closeness to these animals because they share territory and
are part of the same food chains there. Many of the stories
are about the insect called the praying mantis. The Bushmen
believe that Mantis made everything on earth. They also say 50

that Mantis, although now an insect, was once a person and that 50 he has magical as well as human powers. One story is about Mantis and how the little insect outsmarted the large ostrich.

Mantis and Firebird

Long ago, all food was eaten raw and cold. Only the mighty Ostrich, called the Firebird, had fire. He kept it hidden under his wing. Only when cooking his food did the Firebird bring out this fire.

Now Mantis wanted this fire. He wanted his food to smell as delicious as the food of the Firebird. The smaller animal knew that he could not overpower the larger one. But having human powers to think, Mantis thought up a plan. He told the Firebird that there was 51 53 a beautiful little Firebird trapped in a pond. The Firebird rushed there with Mantis to save this poor bird. Sure enough, there in the pond was a bird. This bird looked just like Firebird. Firebird felt that the bird was very beautiful indeed.

As Firebird lifted his wings toward the bird, Mantis quickly stole the fire. Poor Firebird. He had been tricked! The Firebird dropped his wings in shame. 52 From that day on, the Firebird would not fly. His name was changed to Ostrich. And Mantis, true to the ways of Bushmen, shared the fire. This is how people received fire for warmth, and light, and cooking food.

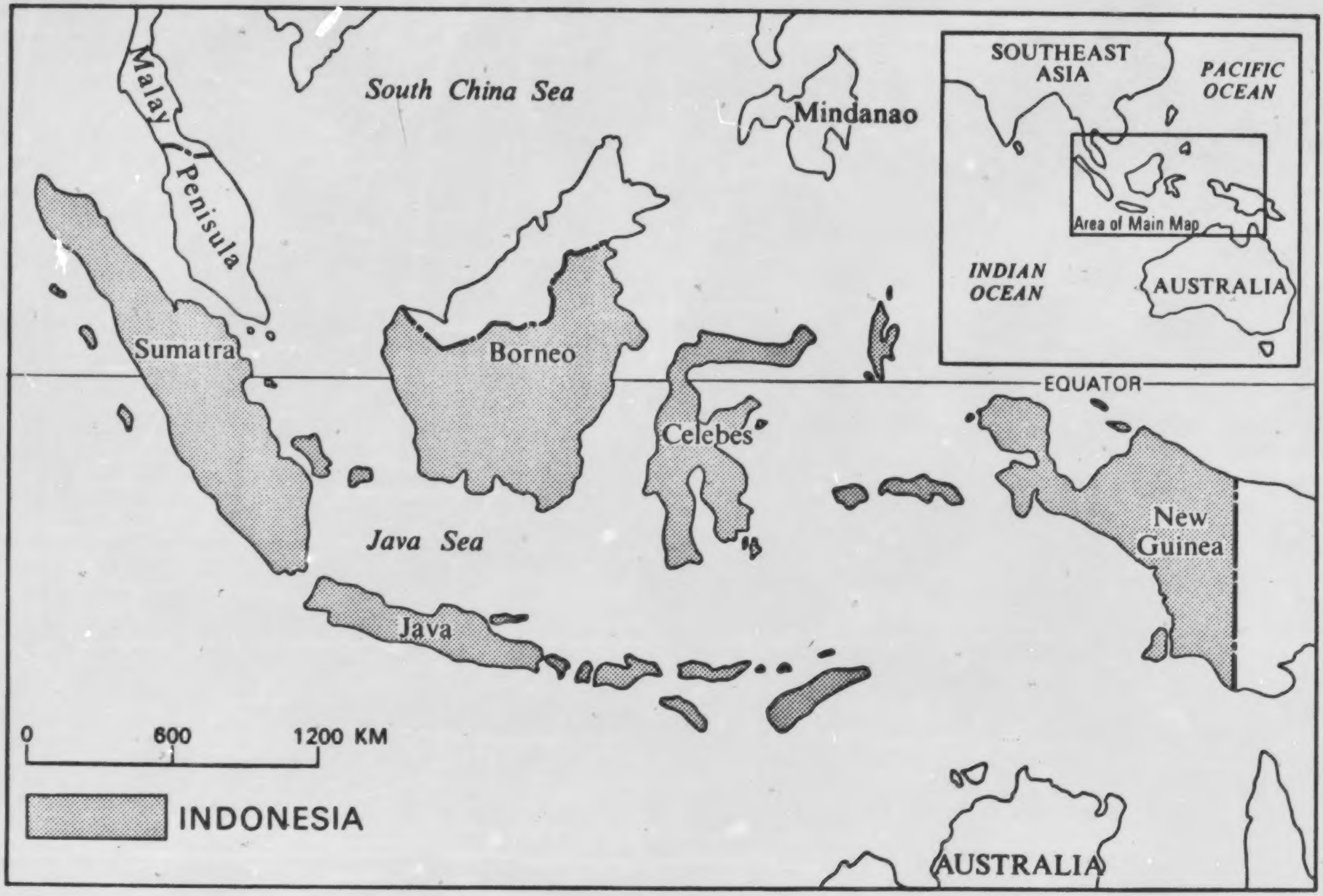
To the Bushmen, the whole world is alive and part of the same
beginning. The shrubs, grass, birds, insects, game animals,
rocks, hills, and sand are a part of their lives. The Bushmen
are a part of their environment. This closeness to the
environment is shown in their beliefs. Their beliefs are those 54
of a hunting and gathering culture.

In adapting to the Kalahari Desert ecosystem, the Bushmen are part of the natural food chains there. They do not change or break food chains. What they do to adapt and survive is part of their culture. What Bushmen think or believe about their environment is part of their culture too.

The Bushmen are just one of several groups of people on earth today who are called hunters and gatherers. Not all Bushmen hunt and gather, however. Many of them work for Botswana farmers who raise cattle. Others work at times for the government of Botswana as workers building roads.

Few groups of hunters and gatherers are left because most
people today practice agriculture. Agriculture is raising crops
and animals in one place. It is also called farming. Agriculture
developed after human beings had been hunting and gathering for 55
thousands of years. Some environments, though, are not suited
for agriculture. Most of the remaining hunting and gathering 56
groups live in environments such as these.

THE ISLAND OF JAVA:
A Tropical Ecosystem


South China Sea
Malay
Penisula
Mindanao
SOUTHEAST ASIA
PACIFIC OCEAN
Area of Main Map
INDIAN OCEAN
AUSTRALIA
Sumatra
Borneo
Celebes
EQUATOR
New Guinea
Java Sea
Java
0
600
1200 KM
INDONESIA
AUSTRALIA

The Island of Java: A Tropical Ecosystem

Halfway around the world from the United States lies the
island nation of Indonesia. Stretching between Asia and Australia,
Indonesia is a chain of more than three thousand islands. In
the center of the chain lies Java. The island of Java is about 1
the size of New York state but has four times as many people. 2
In fact, seven out of every ten Indonesians live on Java. This
is because of Java's rich soil. The many volcanoes on the island
leave rich, fertile soil on the land. There are about 100 active
volcanoes in Indonesia, and over half of these are on Java.

The rich soil and the climate make up the environment for
the food chains of Java. Plants grow well in the good soil.
Both plants and animals are adapted to the warm, moist weather
of this tropical island. Tropical lands are found at or near
the equator, which circles the middle of the earth between the
North and South Poles. Near the equator, the temperature does
not change much from month to month. On Java, the temperature 5
goes from a low of about 68 degrees to a high of about 88 degrees
each day. The number of daylight hours also does not change
much during the year. It is light for twelve hours and dark for
twelve hours every day. Thunderstorms and showers are common.
The air is very humid, or heavy with moisture. The only seasons 3
are a wet one and a wetter one. During the wet seasons, the 4
strong winds, or monsoons, carry heavy rains to Java.

With plenty of rain and steady warmth all year long, Java's
plant life knows no season of dormancy. The whole year is a 6
growing season in this climate. While the weather and the
seasons vary little, there is much variety in the kinds of plants 7
and animals of the Java ecosystem.

At one time, much of Java was covered with tropical forests.
Nowhere is there a place with more kinds of life than a tropical
rain forest. Over 3,000 kinds of plants have been found on the 9
island. From tree roots to tree tops, the forest is full of
growth and movement. Sunlight shines down on the forest, and 8
it is alive with color. Around the trees are rainbow colored
flowers. Figs, berries, and other fruits fill the tree branches,
and brightly colored birds seem to be swallowed into the leaves.

The trees are kinds of broad-leafed evergreens. Their 10
leaves do not change color and fall to the ground. Dangling
loosely about their trunks, large woody vines, or lianas, hang
like uncoiled ropes. Lianas begin life on the forest floor, 11
but they quickly climb toward the sun as they twist and coil
among tree branches. Epiphytes, or air plants, such as wild
orchids, grow everywhere--on tree trunks and branches, even on 12
leaves. Air plants do not hurt the trees on which they grow.
They have no roots in the ground, and they get moisture from
the air. Beneath the arch of green giants, more trees and large 13
bushes spread their wide leaves.

In and around the trees are many other plants that live in
this ecosystem. Brightly colored flowers are all over the 15
forest. Some of the largest flowers in the world grow on Java.

For example, the famous rafflesia has blossoms that measure one
yard across. In some places, bamboo stalks are as much as
thirty inches thick. Bamboo is a treelike grass, and its hollow 14 15
stalks are sometimes used for fishing poles or furniture. All
the flowers and other plants you might expect to find in a
tropical land are there, such as wild orchids, bright red
poinsettias, and wild pineapples.

The forest is full of animal life too. The trapeze artists
of the island, the monkeys, put on quite a show as they feed and
play. Dangling by its tail, one monkey reaches out to pick a
piece of fruit. Another grabs a liana, swings into space, and 17
lands on a distant branch. Parrots, birds of paradise, and
cockatoos rustle the branches. Silently quick death strikes
from the air above, as an eagle digs its strong talons, or 16
claws, into a macaw, which is a kind of parrot.

Many animals feed on the forest plants. Insects are
everywhere, eating green leaves and flower nectar. Nectar is a
sweet liquid found in many flowers. Snakes, lizards, and frogs 18
fatten up on the insects and sometimes on each other. Many
birds either enjoy the flower- and fruit-filled trees or hunt
for insects. Other forest hunters keep the small animal
populations in check by killing only so that they themselves 19
may live.

When the sun dips below the horizon, many animals begin
their nightime prowling. A large snake ripples down a tree trunk 20
headfirst, its tongue flicking in and out. A crocodile slithers
through tall grass on a riverbank. The night is alive with a

thousand movements as the hunters and the hunted stalk, patter, and slither through the forest.

A tropical forest is not just a group of plants and animals
but a great natural system in which living and nonliving things 21
play special parts. Soil, plants, insects, birds, and large
animals all depend on each other in many ways. The huge
broad-leaved trees and other plants capture the sun's energy.
Heavy with leaves and fruit, they provide the basis for food for
every forest animal. Remember, the first link in a food chain
is always a green plant. The energy stored by plants is passed
on to animal consumers when they eat the plants. Then larger 22
animals eat smaller animals, die, and are consumed by decomposers.
This system works smoothly and orderly.

Growing Rice in Java

The earliest people on Java lived as hunters and gatherers. Plants grew well in the rich soil and warm wet climate. The people learned that they could save seeds and grow crops. This meant that they did not need to move around, looking for food. They could remain in one place.

In most places on the island, the tropical forests have
been cleared for agriculture, or farming. Coconut palm trees
are grown by the millions for copra, or dried coconut meat. 23
Rubber, sugar cane, coffee, and tea are grown on large 25
plantations. Pepper comes from Java, and so do spices such as
cloves and nutmeg. Rice is grown on terraces, which look like 24
steps on the hillsides. Rice paddies on the plains, or flat

lands, are everywhere. Rice needs much water and warmth to 24 25
grow, so it grows well on Java.

The Javanese, like most people, live and work in many ways.
Some are factory workers, teachers, and office workers in the
cities. Others work on large tea, rubber, and rice farms. Many
raise rice on small pieces of land near their village.

The Javanese of the villages are adapted to their ecosystem
as agriculturalists, or farmers. Their beliefs and ways of 26
doing things, or culture, show this. Their survival depends
upon the growing and harvesting of rice. On most days, they work
in the rice paddies. Growing rice is a never-ending job. Rice
is planted twice each year--in October and May.

The Javanese villagers are traditional farmers. Traditional 30
means "following tradition." Traditions are ideas or ways of
doing things that have been used for a long, long time by a 27
group of people. The villagers use the same simple tools and
methods that their parents, grandparents, and great-grandparents
used. The power used in traditional agriculture comes from human
and animal muscles, not machines. The planting is made easier
by a system of work which the Javanese call gotong-rojong, 29
meaning community help.

The animal power used in the growing of rice comes from
domesticated animals. Domesticated animals have been tamed by 28
people. On Java, the most common domesticated animal is the
water buffalo. Water buffaloes are big, gray animals with long,
curling horns. They look much like overgrown cows. In spite
of their gentle nature, water buffaloes are very powerful. They
are very good for the hard job of plowing wet rice fields.

Before the rice can be planted, the irrigation ditches, which 31
bring the water from a nearby stream, must be fixed. Then the
farmers let water from the irrigation ditches drip into their
paddies. Next they harness the water buffaloes and plow until 32
the soil becomes soft and muddy. When the paddies are ready, 33
the baby rice plants can be transplanted. These tiny plants
have been growing in seed beds.

While the plants are growing, the farmer and his wife keep 34
working in the paddy. They must keep it free of weeds, and the
water must be kept about six inches deep. The older children
help care for the plants in the afternoon. They must go to school 35
in the morning. Even little children help by making noise to
frighten the birds. Hungry birds can eat up a whole rice crop
if they are not kept away. Rice is part of birds' food chains 39
too! Almost every rice plant grows well in the paddy because
the people take such good care of them.

Each family may own their own field of about two acres, but
they work with other people of the village. They share irrigation 36
water, animals, and tools with each other.

At harvest time, the whole village again works together in
the gotong rojong spirit. Harvesting, or gathering the crop,
is everyone's job. Men, women, and children all work. As
soon as the rice grows tall and yellow, a long row of workers 37
moves across the field. They cut each stalk with a small knife
called an ani-ani.

A machine or even a longer knife would make the work much
easier. Why do the Javanese use the ani-ani? Growing rice is

not just producing food to the Javanese. It is part of their traditional way of life, and using the ani-ani is part of their
tradition. Most Javanese farmers believe that the rice gods 38
would be angry if the farmers changed to a new way of cutting rice! They also believe that the anger of the rice gods can be prevented if the knife is held in the palm of the hand when cutting the stalks.

Finally the rice is harvested, and the stalks are laid in the sun to dry. When they are just right, threshing starts. Threshing breaks the rice-filled husks from the stalks. The
Javanese thresh the rice plants in a carved-out log. First, 39
the stalks are laid in the log, and then they are pounded with a wooden post. This breaks the husks of rice from the stalks, and it also cracks the tough husks.

The next step in winnowing. Winnowing means separating the loosened husks from the rice grains. The farmers toss the husks and grain into the air. Because the rice grains are heavier than the husks, they fall back onto the ground. The light husks are blown away by the wind. They do this over and over until only the rice grains are left on the ground. Then the rice is picked up and stored in jars or large woven baskets. When the harvest has been good, everybody is happy. It means joking, singing, and a good feast for all the villagers.

The Javanese are a part of some nonagricultural food chains.
Catching and eating fish is one example of adapting to a natural 40
food chain. Another is eating the coconuts, bananas, papaya, and mangoes which grow wild on the trees in Java. But Javanese

depend mostly upon rice. Rice is their chief food. The Javanese have changed their environment to grow rice. They have cleared land and irrigated fields. They adapt to growing rice by living in permanent villages, by working together as families in the rice fields, and by helping their neighbors in the spirit of gotong-rojong. 41

The houses of Javanese farmers, like the growing of rice, are suited to the warm, damp climate. The most important part of the house is the roof, often made of palm leaves. The palm thatch provides good protection from heavy rains. Red or pink clay tiles or slabs of wood are also used for roofs. The sides of the house may be only screens of bamboo or palm matting. In many areas, the houses are on stilts a few feet above the ground. This prevents ground animals, such as snakes, from coming in and out. The house is also dryer, cooler, and less muddy when built above the ground. 42

Javanese clothing is often different and colorful. Some people wear Western clothing, especially in the cities, but most people wear traditional dress. The cool clothing is made from cotton. Often, it is dyed black, brown, or dark green. Many Javanese, however, wear clothing dyed by the colorful batik method. To batik material, melted wax is poured over the cloth in different designs. Then the material is dyed. The dye cannot soak through the wax but it does soak through the material. When the wax is removed, a design is left on the cloth. 43

Javanese women wrap a wide piece of cloth called a *kain*
several times around their waist. Instead of a blouse, they wear
a *kebaya*, a flowery cotton jacket. They carry a *selendang*,
a long thin piece of cloth. They can twist the selendang around
their neck as a scarf or loop it over their shoulder. When they 44
loop their selendang, it holds their babies or their groceries!
The women often decorate their hair with pins or combs made of
shell, silver, or painted wood. The natural tropical environment
provides beautiful flowers to tuck into the hair or make into
a chain to wear as a necklace.

The traditional clothing of the men is a *sarong*. A sarong
is a wide piece of material which is wound around the waist.
An open-collared shirt is often worn. Some men still wear a
turban on their head. A turban is a flat headdress with many
folds. It is made by carefully folding and wrapping a long
piece of material. A long time ago, you could tell where a
man came from by the way in which his turban was folded. Now,
more often you see the black velvet cap called a *pitji*. The 45
pitji stands for the spirit of togetherness of the new nation of
Indonesia.

In this warm climate, people often go barefoot. It is a
simple matter to rinse muddy feet during a quick, refreshing 46
bath. A Javanese person may take several quick baths each day 47
and put on a fresh dry set of clothing after each. Things
become damp quickly in the humid tropics.

Like all peoples, the Javanese must have food for the spirit as well as food to eat. They have beliefs that explain their way of life in their environment and stories that teach and amuse everyone. How people have fun is part of culture too. Many celebrations and festivals are tied to the planting season, the growing season, and the harvest season. There are also celebrations to mark the end of the children's religious training, birthdays, and marriages. All of these happenings are celebrated with a *selamatin*. Selamatin is the Indonesian word for "feast."

48 At the feast, or selamatin, a crowd of friends, neighbors, and relatives gather. All kinds of good foods are set out. Naturally, there is plenty of rice, for no Javanese meal would be complete without it. There are vegetables cooked in coconut milk, raw vegetables with peanut sauce, spicy meat dishes called curries, and perhaps some turtle meat. A special food is sate, characoal-barbecued goat's meat which is put on a stick and dipped in peanut sauce.

If the *selamatin* is a big one, there is even music for dancing. The most exciting time of all, however, is when the evening ends with a *wayang kulit*. It's a Javanese shadow play in which puppets are used. The puppets are flat and cut out of a hard material, but they have arms that move. The *dalang*, or puppet master, arrives and gets everything ready. First, he spreads a piece of white cloth over a wooden frame. Then he hangs a lamp behind the cloth. Next, he takes his puppets from a large box, and finally, the dalang is ready to begin. 49

By now a large crowd has gathered. Children sit in the front
rows, eating candy and peanuts, while the adults stand in back.
Soft music begins to play, and the dalang presents his players.
He holds up the puppets and makes their shadows move on the screen. 50
He changes his voice so that each puppet has its own way of 51
speaking. Soon everyone forgets everything except the magic
of the show.

The play is long. It doesn't usually end before four o'clock
in the morning. But young or old, no one thinks of going home 52
to bed before the play is over. Nearly everyone knows the
stories by heart, but no one tires of hearing them again.

The play may be several of the stories about a clever little animal called the mouse-deer. In these stories, the smaller animal uses his wits or cleverness to win over larger animals. He often tricks his two natural predators, the tiger and the crocodile.

Pelanduk and the Plums

Pelanduk, the one-foot-tall deer, is on his way
through the forest to pick some juicy plums. The plums
grow on a special tree on the other side of a wide
river. "Ah! How delicious they'll be!" Pelanduk
thinks to himself. He licks his lips with his tongue 57
and speeds up a little.

"Oh, no! So there you are," roars a huge tiger
coming out from behind a clump of bushes. "What are
you up to today, you tasty, little mouse-deer?"

Now Pelanduk wants to keep his plum tree a secret. He thinks of a plan. "Well," he says. "As you may have guessed, I am in a great hurry. In a dream last night, the hummingbird whispered a message in my ear. I am to find the Raja's drum, which is in a special spot by the river. Whoever finds the Raja's lost drum will have any wish granted when he beats on it. The Raja's lost drum has magical powers! Come along if you wish!" 53 54

The tiger quickly joins Pelanduk on his journey to find the drum. "Ah, to have plenty of juicy red meat, sunshine, and a huge warm rock to sleep on! Ah, to rule the tigers in the forest! Ah, to rule the tigers everywhere! Ah, to rule everything, everywhere!" 57 the tiger says to himself.

At last the tiger and tiny mouse-deer reach the river. But where is the drum? It is not on the riverbank, and it is not under the palm trees.

"Oh," says Pelanduk. "I think I see the drum high up in that old banyon tree. But I can't climb trees."

Up the tree zooms the tiger. He quickly breaks off a banyon leaf and begins to beat with its huge stem. There is no clear beat from a drum. Instead, there are millions of wasps. They swarm all over the bewildered tiger. Wasps do not like their nest to be disturbed! 55

From the riverbank, Pelanduk watches as the tiger, covered with angry wasps, frantically jumps into the river. "Now," says Pelanduk, "On to crossing the river and eating those delicious plums!" But how will Pelanduk get across the wide river? 56

Seeing a crocodile lazily floating by, Pelanduk comes up with a plan. "Oh, Crocodiles. I would like your attention, please," he says, "The Raja has sent me to count all the crocodiles in this river. Will you please come to the surface?" Proud to show off their sleek, shiny bodies, the crocodiles appear like thick floating logs on the surface. 57

Jumping from the back of one crocodile to the next, Pelanduk counts loudly, "One, two, three, four,...fourteen," until he reaches the other bank. The clever mouse-deer hurries on to eat plums at last!

The mouse-deer in the story is like a person. He can think up tricks and ways to keep from being eaten by larger predators. He is able to stay alive because he is adapted to an environment of larger, meat-eating animals. Humans do not have to worry much about meat-eating predators, but they, too, use their brains to help them survive. Many, like the Javanese, survive by becoming agriculturalists.

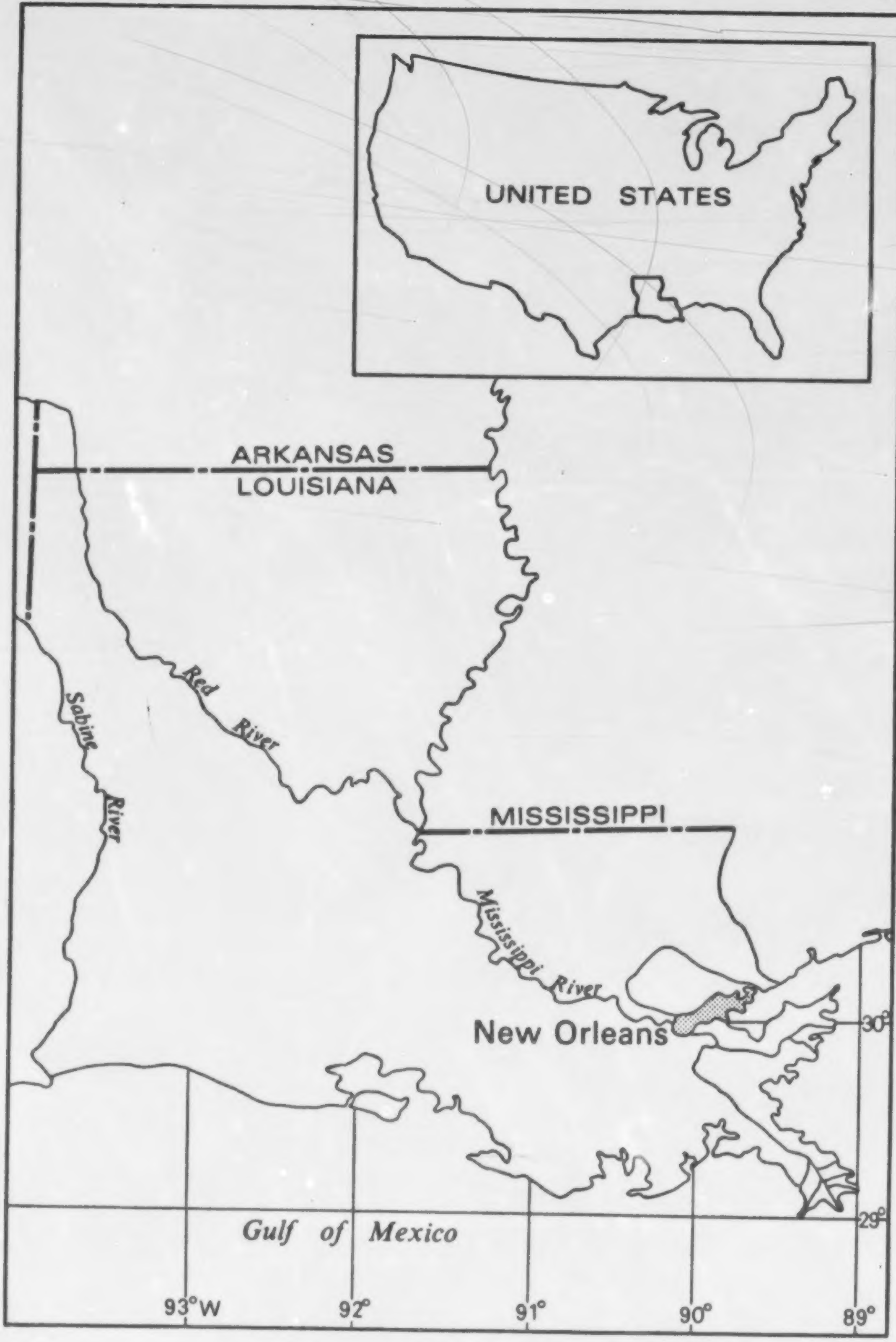
186

People change ecosystems when they grow crops and raise animals. The people of Java have cleared much of their tropical forest land for agriculture. They are just one of many people who have cleared tropical forest land to grow crops like rice, rubber, coffee, and cocoa. As land is cleared, roads are built. People build homes along the roads. Thousands of forest animals are forced to move because their environment is destroyed. Some plants and animals begin to die out. Food chains are broken. There is no longer a balance among all living things of the ecosystem.

58

Hunters and gatherers take only what they need from their environment. They are part of the natural food chains. Agriculturalists begin to unbalance natural ecoystems when they clear land and depend mainly on one crop. The ecosystem must try to reach a new balance. Agriculture is not the only cause for change in an ecosystem. Industry can change the ecosystem even more.

NEW ORLEANS:
A Cypress Swamp Ecosystem


UNITED STATES
ARKANSAS
LOUISIANA
MISSISSIPPI
Red River
Sabine River
Mississippi River
New Orleans
Gulf of Mexico
30°
29°
93°W
92°
91°
90°
89°

New Orleans: A Cypress Swamp Ecosystem

The area where the Mississippi River flows into the Atlantic
Ocean is lowland. This lowland was once a natural cypress swamp.
A cypress is a kind of tree. A swamp is wet, spongy land, which 1
may be covered with water in some places. Many small plants,
bushes and trees grew in this cypress swamp near the end of the
Mississippi. The swamp also was a home for countless animals,
such as raccoons, rabbits, birds, and insects. Alligators,
turtles, and fish lived in the muddy, brown water.

Much of the swamp has been drained and cleared. Today,
the city of New Orleans, Louisiana, lies on this land.

The plants and animals of the ecosystem in this area are
adapted, or designed, to live in a subtropical climate. Like
a tropical climate, the weather is warm, and there is plenty 2 3
of rainfall. However, a subtropical climate is not as hot, and
the temperatures are not the same all year long. Temperatures
in January average around 52 degrees and in July around 82
degrees. Occasional hurricanes, with very strong winds, dump
great amounts of water. Too much water is often a problem here.

Pretend that you are visiting this place about two hundred
and seventy-five years ago. Only the Tunican Indians lived in
the area then. Arriving just before dawn, you find the great
cypress swamp dark but not quiet. Since sundown, the watery
woods have been ringing with the noise of birds, frogs, toads, 4
and alligators.

The loudest of the noisemakers are the limpkins. Limpkins
are feathered waders which the Indians call "crying birds."
Waders are shore birds that wade, or walk in shallow water, looking
for food. "Kree-ow, kree-ow, kree-ow," cry the limpkins. From
their treetop roosts, black vultures look down on the limpkins. 5
A raccoon on the muddy shore hears the birds too. The raccoon
is a night hunter and is finishing a feast of young frogs. As
it wanders away in search of more food, its tracks are left in
the mud beside those of a deer, bobcat, wild hog, and heron.

On higher ground, among the cypresses, a hammock has formed.
The word "hammock" comes from the Indian word hamaca, which 6
means floating forest or island. On this island made of twisted
roots and leaf mold, some trees tower up as high as one hundred 7
and fifty feet. The hammock is the home of the countless raccoons
that live in the cypress swamp. The raccoons curl up into balls 8
and sleep during the day. The hammock is also the home for
many birds, butterflies, lizards, turtles, and snakes. It is,
in fact, a community all its own in the heart of the swampland.

From a tall cypress at the hammock's edge, two woodpeckers
listen to a redbird's call. The redbird's call is a signal that
dawn is on its way. The limpkins, night herons, frogs, and
toads begin to fall silent. As the sky lightens to a blue gray, 9
a hush comes over the swamp. All at once it is daybreak. The
huge, orange sun floats slowly into the sky. Birds call loudly
through the branches. Only the night animals are quiet now.
The many forest animals begin their daily duties. By midmorning, 10

the sun is high over the cypress swamp. The nightblooming flowers
have long since folded their petals. The dewdrops have dried.
Most birds have finished their morning songs and are gathering
twigs or feeding. As alligators sun themselves, egrets and 10
herons fish busily over the water. Turtles climb out onto the
tops of logs to warm themselves. A large water moccasin snake
hangs from the branch of a sweet bay tree.

At the top of a neighboring tree, two ospreys, or fish 11
hawks, are rebuilding their last year's nest. The nest is made 12
of many sticks and is lined with Spanish moss. Spanish moss is 13
neither Spanish nor moss. It is a flowering air plant. The
birds fly back and forth, bringing moss from other cypress trees.
On the nest, they pull the moss with their claws and jab it with
their beaks. They shape it to make a soft mattress for their
eggs and young. One of the ospreys sees a mullet, a kind of
fish, leap in the water. The fish hawk dives toward the water 14
without a sound.

A brown lizard goes searching for food. It slides off its 15
branch onto a nearby leaf where a small beetle is feeding. As 16
the lizard rests on the leaf, eating the beetle, the lizard's 17
color slowly changes from brown to green.

A black and yellow striped butterfly has been hanging, half
asleep, on the underside of the lizard's leaf. When the lizard 18
arrives, the butterfly feels the leaf move and floats off. The
butterfly flies down narrow, sunlit trails and pathways in the
swamp. Across one of the trails, a spider has hung a web and is

lying in wait. The butterfly sees the web just in time and is able to avoid the trap.

Animals that make a swamp ecosystem their home find there
what they need to live. Producers, such as the cypress trees
and water lilies, trap energy from the sun. They produce, or make
food for consumers, such as insects and other small animals. 20
Other consumers, such as the ospreys and raccoons, eat the insects 19
and small animals. These plants and animals are all linked
together in the cypress swamp food chains.

You have seen a day that is like every other day has been
for thousands of years in the swamp. However, some things have
changed in the cypress swamps in the last two hundred and 21
seventy-five years--just like they have in other swamps around
the world. Next, you will see what has happened to the cypress
swamps of New Orleans.

New Orleans: An Agricultural Ecosystem

The earliest people in the swamp ecosystem were hunters and gatherers. They were part of the natural food chains and did little to change the land. The Tunican Indians, who lived along the coast, raised crops but used very little land in doing so. They collected and planted the seeds from pumpkins, corn, melons, and beans that were growing wild. The Tunicans used many other things from their environment. Canoes were made from hollowed out logs. From these canoes, fish were pulled in with woven fish traps. The walls of Indian homes were built with plaster made of clay from the earth. Spanish moss was added to the

clay to make it stronger. Roofs were made of palmetto thatch. 22
The leaves of this smaller palm tree made sturdy roofing, or
thatch.

The natural ecosystem had been changed very little when a 23
group of settlers arrived from France in 1718. The French were
looking for a place to settle near the mouth of the Mississippi
River. Forest land was cleared, ditches were dug, and cabins were 25
built. Wild animals were forced farther back into the forest. 24
Some animals, such as the chipmunk and the squirrel, stayed
behind. They could adapt to the changes going on around them.
Some animals could not adapt or escape, and died.

Streets were laid out in the new settlement. The settlement stretched eleven straight blocks along the Mississippi River and six blocks back toward the woods. Beyond the woods, swampland still stretched for miles. The settlement was the beginning of the city of New Orleans.

The little settlement grew to have almost five hundred
people in a few years. The settlers changed the ecosystem by
clearing forest land for agriculture. They grew large crops of 27
plants that were already part of the natural food chains. The 26
chief crops at that time were rice, tobacco, and indigo. Indigo
was used to make a blue dye for cloth.

Agriculture became a success in the area. The soil was rich, rain was plentiful, and the growing season was long. In such an environment, crops grew well.

Many plantations sprang up around the little town of New
Orleans. A plantation is a very large farm where only one or two
major crops are grown. The plantation workers at that time were 28
mostly slaves, usually Africans who had been taken by force from
their homeland.

The plantation owners sold their crops in New Orleans.
Horse-drawn wagons pulled some of the harvested crops to warehouses.
Other owners used large rafts to bring the agricultural products 29
down the Mississippi River to warehouses built right next to the 30
river.

Some crops were traded to cities located farther up the
Mississippi. Other crops were sent on sailing ships to Europe.
The plantations produced great wealth and helped New Orleans to 31
grow as a trading center. New Orleans started to attract large
numbers of people. More plantations were started, and cotton and
sugar cane crops began to be harvested. Cotton and sugar cane
became more popular than the natural crops of the area. More
and more land was cleared for agriculture.

Clearing land was not the only reason why the natural
ecosystem of the area was changed. Cypress and tall pine trees
were cut down for lumber. Many small animals, such as the mink
and the muskrat, were trapped for their fine fur. People 32
were using the natural environment for much more than to survive.
They were building their wealth by harvesting and selling trees,
furs, and extra crops.

In spite of floods, sicknesses, Indian raids, and hurricanes,
New Orleans became a great city. When the area was bought from

France by the United States, New Orleans was beginning to flower.
It was the most important city in the entire Mississippi Valley.
All roads led to the Mississippi River, and the Mississippi led
to New Orleans. Agricultural and forest goods were sent down
the river to be traded in New Orleans. From the wealth built
up from agriculture and trade, manufacturing and industry began 33
in New Orleans. Manufacturing is the use of machines and workers
to make things. Industry is manufacturing, trading, or business
on a large scale.

New Orleans: Now an Industrial Ecosystem

Today, New Orleans is a large industrial seaport. Many factories and tall buildings have been built. Highways and bridges connect all parts of the city. Everywhere, changes have been made in the natural environment.

The New Orleans harbor is one of the largest in the world.
It has more than twenty-six miles of docks. Often, more than
one hundred ships can be seen there at one time. The ships come
across the ocean and bring products from all over the world.
Products from a large part of the United States come down the
Mississippi River. Without the Mississippi River and the ocean,
New Orleans would not have become a center for buying and selling. 34
The environment has made New Orleans great.

The coming of large industries to New Orleans has made the
greatest use of the environment--and the greatest changes. The
earliest manufacturing industries of New Orleans used the farm
and forest products of the environment. Sugar cane was made 36

into sugar at a large sugar refinery. Factories turned the cotton
bolls from cotton plants into thread and then into finished cloth.
Tanneries were built to tan the hides of animals into leather. 36
Today's industries depend upon the environment for farm, forest,
and mineral products more than ever before. These products are 35
changed into finished goods by more machines and fewer people
today than in earlier times.

Sugar cane, rice, and cotton are still grown in the area, but
farming is now an industry. This has brought many changes.
Many of the very large farms are owned by groups of people who
do not live on the farms. Machines are used to plow, plant, and 37
harvest crops. Pesticides are used to kill insects. Fertilizers
are added to the soil. Farming today is very different from
farming done by the Tunican Indians or the early plantation
owners.

Another large industry uses food from the sea. Shrimp,
oysters, and other seafoods are gathered into motorboats. The
seafood is cleaned and then canned or frozen in the factories of
New Orleans.

Other products of the natural environment are gathered for
industry. Spanish moss is used as padding to stuff furniture. 38
Wood from many trees in Louisiana is turned into paper bags, boxes,
and boards. From beneath the ground, large machines gather
sulfur and salt, and oil and natural gas are pumped to the
earth's surface. These minerals are made into many new products
in the factories.

The Indians and early settlers also used many things from the environment. They too fished, farmed, and used wood and moss. But in today's industrial ecosystem, much more of the environment is used by many more people. The Indians and early settlers used small plots for farming. Today's large industrial farms use thousands of acres of farmland. The Indians and early settlers took only what they needed for themselves from the land and the sea. Industries today take much more from the environment than what they need for themselves. They take enough to trade with other people in the United States and around the world. In some places, everything is taken. Certain kinds of fish disappear. Sometimes, whole forests are cut down. 39

With so many changes, very little of the natural environment is left. A whole new environment has been made. It is an artifical environment, one made by people. In a natural environment, people try to adapt themselves to the natural ecosystem. In an artifical environment, people try to change the ecosystem to fit the needs of industry. They feel that their environment should serve them. 40

Every city is an artificial environment. Everywhere, people try to make a comfortable place to live, but they do not always plan what to do about the plants and animals of the area. When factories and homes are built, many animals and plants are destroyed. Some of the animals, like mice, rats, and cockroaches, are able to adapt well to the new environment. However, they are pests to an industrial culture. 41

An artificial environment causes other problems. People do not always plan for what will happen to the air and the water. In New Orleans, many large factories are built along the banks of the Mississippi River. The river makes transportation easy and also provides water for use in the factories. However, many factories flush their wastes into the river. These wastes pollute the water. Polluted water is not pure or clean. A polluted river kills many plants and animals and destroys the natural food chains. 42

Water is not the only thing that becomes polluted in an artificial environment. Many factories send smoke into the air. Smoke causes air pollution. Air pollution hurts human beings, animals, and plants because it cuts down on the clean air that can be breathed.

Industry has brought many people to New Orleans to work. Over a million people now live in the area. More and more automobiles are being driven to work, and their smoke is polluting the air. Homes and highways are using more and more land. Home owners are using many products and making a great amount of garbage. People have not planned for all these changes in the environment.

Water and air pollution are problems in almost every large industrial city. Only recently, however, have people noticed pollution's great damage. Cities are now making changes so that pollution will not be as great. The changes are very expensive. It costs much money to clean water with sewage treatment plants. It costs a great deal for factories to clean their smoke and polluted water. Progress is slow, but it is coming.

New Orleans is a leader in finding better ways to dispose of garbage. The city has a plan in which machines will separate useful materials, such as metals, glass, and paper, from trash. These materials will be sold to factories to use again. When materials are used again, they are recycled. The plan will cut the cost of disposing of garbage in half. Less land will be needed to bury the garbage that can't be recycled. This is one way New Orleans is working to solve the problems of its artificial environment. 43

New Orleans has a bigger problem that has been taking longer to solve and costing much more money. The problem started during the time that New Orleans was first settled. The streets were laid out on lowland where the Mississippi River flows into the Atlantic Ocean. The land, though very low, must have seemed firm to the settlers. However, long ago it had been swamp and marshland. The soil below, called peat, was very soft and spongy. It was not firm enough to hold a city. Over the years, some of the land sank as much as five feet below sea level. 44

As the city grew, people ran out of dry and high land on which to build. Finally, swamps had to be drained. Much of the drained land was below sea level and slowly sank over the years. 45

As the land sank, more levees, or banks, were built along the river, Lake Ponchartrain, and the ocean to keep water out. The levees do a good job in keeping ocean, lake, and river water out of New Orleans, but they also keep rainwater inside the city. 46 Large pumps, pipes, and canals were built to carry rainwater out.

Without them, New Orleans would fill up like a bathtub. It rains about fifty-seven inches a year in the city.

People have to go to a lot of trouble to make an artificial environment. It costs money and damages the balance of the ecosystem. In New Orleans, over 110 square miles of swampland have been drained. Something like 87 miles of canals and 57 miles of large pipelines have been built. Over 1,258 miles of underground drains have been dug. The pumping system is the largest in the world. The twenty-one pumping stations use enough electricity to serve a city of 86,500 people.

Today, people still plan to build on the low swampy land
outside of New Orleans. They will drain the land, and it will
sink. As the land sinks, roads and sidewalks will crack and 47
underground pipes will burst. Much of the land will need
protection from high tides and hurricanes. New and expensive
flood protection plans will have to be made.

Whenever people drain a large section of swampland, many
plants and animals lose their homes and often their lives. The
fishing industry and recreation must stop in the area. Much
money must be spent to drain the swamp and build levees, pipes,
and canals. Now planners must prepare environmental impact 48 49
statements before land is drained. These reports tell how the
environment will be changed and what it will cost. They tell
how plants, animals, water, air, and other parts of the
environment may be hurt or helped. The planners must try to
cause the least amount of damage.

The people of New Orleans and people in other places are learning more about how the environment works. The more they learn, the more interested they are in keeping the air and water clean and in saving parts of the natural environment. Now they have to make choices. They have to decide if draining another swamp is worth the cost. They have to decide if building another factory is worth the pollution it may cause. The choices are not easy to make. Land is needed for homes, ships, and places to work. Factories are needed for jobs and the products that are made there. People want to use the land, air, and water without harming the environment, but that is hard to do. Hurting the environment is a part of an industrial culture. 50

The people of New Orleans have worked very hard and have spent much money to make New Orleans a great city. They have turned a difficult environment into a pleasant place for people to live. As with all cities, however, they have done so at a very high cost to the natural environment.

New Orleans: The City of Mardi Gras

Like the other cultures you have studied, the industrial culture in New Orleans has traditions and stories of its own. When people left their homelands to come to New Orleans, they brought their traditions. Today, the city is a colorful mixture of French, Spanish, Black African, Irish, and German cultures.

Perhaps no other city name in America calls forth such clear pictures as New Orleans. New Orleans is the city of Mardi Gras, a very special holiday. Picture all the beautiful 51 colors you've every seen swirling before your eyes. Add many happy, laughing faces, dancing feet, and waving arms. Next, imagine huge, shiny floats and marching jazz bands moving through the middle of the crowd. This will give you just a little idea of what Mardi Gras is like. 51

Mardi Gras is a celebration of feasts, marches, and dances that occurs just before Ash Wednesday. Masks and costumes are worn, and a king and queen are chosen to reign over the entire celebration. Mardi Gras was a religious custom of the French, who were the first to settle in New Orleans.

As other ethnic groups came to live in New Orleans they added their own cultural touches to the celebration. Many of the black people of New Orleans, for example, had a tradition of dressing like American Indians for Mardi Gras. They belonged to "tribes" of twenty-five to thirty members. Some names of the tribes were the Yellow Pocahontas; Little Red, White, and Blues; and the Golden Eagles. Most members made beautiful costumes of feathered headdresses and pants covered with sequins and 52 beads.

About forty years ago, many of the tribes actually fought when they met. Some of this spirit is caught in this tribal song:

Oh the Little Red, White, and Blues,
Tu-way-pa-ka-way
Braves and Indians in the land,
Tu-way-pa-ka-way.
If you should get in their way,
Tu-way-pa-ka-way.
Oowa-a-a!
Oowa-a-a!

The tribes finally decided to become friendly. This song is a warning against the ways of the past:

Shootin' don't make it, no no no no.
Shootin' don't make it, no no no no.
Shootin' don't make it, no no no no.
If you see your man sittin' in the bush.
Knock him in the head and give him a push,
'Cause shootin' don't make it, no no.
Shootin' don't make it, no no no no.*

Much of the culture of New Orleans is a blend, or mix, of the cultures of the people who settled there long ago. Mardi Gras is only one example. The French Quarter is another. The French Quarter is a part of the city that was built by the early French settlers. French words are still commonly used. The sidewalks are called banquettes. Balconies, or upstairs porches, are called galleries. 53

While New Orleans was owned by Spain, The French Quarter burned down. The area soon was rebuilt, however. 54 Wrought iron railings in lacy designs were added to balconies. Stucco, a kind of plaster, was used on walls. Tiles were used for roofs. The new French Quarter looked very Spanish!

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*Reprinted with permission of the publisher. From Lyle Saxon's (Compiler) Gumbo Ya Ya. Boston: Houghton-Mifflin, 1945.

The blending of French and Spanish cultures in New Orleans is known as the Creole culture. Because New Orleans was first owned and settled by the French, this mixture of cultures is mainly French. The sons and daughters of the early French and Spanish settlers were called Creoles. Some of the later German and Irish settlers married Creoles, but soon dropped their old ways for French, Creole ways. In the French Quarter today, you hear the French language and eat Creole cooking. 55

The Creoles of today do not live apart as a special group. Although many of the beliefs and old ways of doing things are gone, much of the Creole culture has become a part of the culture of New Orleans today.

Many of the Creole folk songs have been written down. One of these tells about a lady made like a sandwich. Most of the characters in the song are made of sweets and pastries. Except for Prince Lemonade, these make-believe characters are French desserts. Madame (Mrs.) Tartina is a tart, or special pie. Monsieur (Mr.) Gimblette, is a dessert with cheese on it called a Gimblette, Charlotte, the Princess, is a cake called a Charlotte Russe.

Dame Tartina

There was a lady made like a sandwich
Living in a palace of fresh butter.
The wall was made of flour,
The floor was made of crisp biscuit,
The bedroom was of milk and cream,
The beds of cookies.

She married Monsieur Gimblette,
Who wore a hat of fine white cheese,
His suit of buttered roll,
His vest of puff pie,
His cap made of nougat,
His vest of chocolate,
Stockings of caramel,
Shoes of honey.

Their daughter Charlotte
Had a nose made of sponge cake,
Her fine teeth of jam,
I see her trim
Her party dress
With a roll of
Apricot paste.

The great Prince Lemonade,
His hair well curled, comes to court her;
His suit was of marmalade
Trimmed with baked apples.
Everyone shuddered on seeing his guard
Made up of capers and pickles
Armed with guns of mustard
And with swords of onion skins.

On a throne of rolls
Charlotte and the king are going to sit.
The candies were dropping from their pockets
From early morning to night.

But here comes the fairy Hunchback,
Jealous and in bad humor--
She upset with a sweep of her brush
The palace sweetened with happiness.

To build it again
Give, dear parents,
Plenty of sugar to the children.*

---

*from Gumbo Ya Ya

The Creoles sang this to very young children in French, not English.

The Creoles and black people of New Orleans had many
superstitions, or beliefs, to explain why things happened or to 56
give tips on how to make things happen. Some of the beliefs
were of magic and witchcraft. New Orleans has been called the
city of voodoo, or hoodoo. Hoodoo means to bring misfortune by 57
casting a spell or bewitching someone. Voodoo means to cast a
spell, using words or charms with magical powers. Voodoo had
its beginnings in Africa, but different kinds of superstitions 58
have been believed by all groups at some time in the past.
Here are some examples of superstitions of long ago in New
Orleans:

Chills and Fevers

Charm: (A charm is believed to cure or prevent.)
Squeeze a frog to death in the hand.

Medicine: Tea of L'Herbe Cabri (coat grass).

Bet-Wetting

Feed roasted rat or dried pumpkin seeds with salt to bed-wetters.

Corns

Let a snail crawl across your toes.

Indigestion

Eat sand and charcoal, or make a tea of the inside of a chicken gizzard.

Good Luck Charms

Always burn the onion peels, you will always have money.

Eat Creole cabbage on New Year's Day for good luck all year.

Black Magic

To hurt an enemy, put his or her name in a dead bird's mouth and let the bird dry.

If someone has bitten you, put some chicken manure on the wound, and all of your enemy's teeth will fall out.

Taboos (Taboos are things one should not do or misfortune may follow.)

Don't raise your foot higher than your head. 59

Don't walk on salt, peanut shells, or onion peels.

To Get Rid of a Neighbor

Kill a black chicken and throw it over his house.

To Win Love

(If a man) Take some of the desired one's hair and sleep with it under the pillow. Rub love oil into the palm of your right hand. Carry a piece of weed called "John the Conqueror" in your pocket.
(If a woman) Place the man's picture behind the mirror. Write the man's name and yours on separate pieces of paper. Pin them together in the form of a cross with yours on top. Put them in a glass of water containing sugar and orange-flower water. Burn a red candle before this glass for nine days.*

These superstitions were ways of explaining things. If you
had bad dreams, it was because a witch was after you. If you
got rid of a stomachache, it was because you ate sand and 60
charcoal, or drank chicken gizzard tea. Today in New Orleans,
you go to a doctor to cure bad dreams or indigestion.

---

*from Gumbo Ya Ya

Ways of explaining things and doing things change. Culture changes when people become closer to machines and science than to the natural environment. The culture of New Orleans has changed. But much of the past adds a special flavor to this industrial city.

APPENDIX B

ADJACENT-TO-TEXT ACTIVITIES

LIFE IN ECOSYSTEMS

ACTIVITIES

Name________________

School______________

A Pond Ecosystem

1. Look for the sentence next to the marker ⌋ 1 which says that:

The land is a bit higher and dryer through the opening in the trees.

Write the sentence here. a.____

____

____

Note: A sentence can often be written another way without changing the meaning.

This sentence does not say the same thing as the sentence in the story.

The trees are high and dry in the opening above the land.

Change some of the words to make the sentence say the same thing as the one in the story. Write the sentence here.

b.____

____

____

2. The topic of the passage marked ⌋2 is plants in and around the pond.

Note: A passage is a group of sentences that belong together. These sentences belong together because they all tell about one topic. A topic usually can be given in two or three words. The sentences of the passage ⌋2 give information, or tell about, plants in and around the pond. Name six of these plants.

____________________ ____________________

____________________ ____________________

____________________ ____________________

3. A person diving with equipment called a snorkel must come to the surface to breathe. Surface means top. To come to the surface means to come to the __________ of the water. If you dive with a snorkel you cannot breathe ____.
What is the animal named in the sentence marked ⌋3 that cannot breathe underwater? ____.

4. Bluegills swim near the ____________________________ of the pond.
top bottom middle

The word in the sentence by ⌋4 that tells where bluegills were swimming is the word.

5. Information in passage ⌋ 5 names the following:

Information

bluegills

sunfish

bass

watersnake

frogs

turtle

All of these are names of (one word) ______________________________.

Where do they live? ____.

They are noticeable because they are ______________________________.

Note: The information above tells more about the central thought of the passage. The central thought is what a passage is about. A central thought is like a topic but it tells more completely what a group of sentences are about. A central thought is more like what is often called a main idea.

Write a sentence to tell the central thought of passage ⌋ 5.

____

____

____

6. Look at the sentence marked ⌋ 6 to answer this question. When does the tadpole begin to eat the tiny algae plants?

____

____

7. Energy is something that you cannot see. Your body uses energy all the time. This energy is made by your body from the food you eat. The passage marked ⌋ 7 tells you that a tadpole uses a lot of energy to find food. It also uses up energy when it ________________ the food. A tadpole also uses energy for ___________________________

____.

8. A bluegill is larger than a tadpole. Larger animals often kill small animals for food. In the passage marked ⌋ 8, the tadpole is killed. What killed the tadpole? ______________________________________

____

9. A blue heron is a very large shore bird. It eats fish. Study the passage about the bluegill, the tadpole, and the heron. You are not told how the bluegill had his side torn open. You are told that the sharp beak of the heron finds its mark. A mark is a target or goal. What do you think tore open the side of the bluegill?

____

Why do you think the bluegill did not get to eat the tadpole?

____

____

10. The bluegill disappears down the throat of a heron. A word part called a prefix (dis) has been added to the baseword (appear) to make a new word, (disappear).

Prefix + Baseword ⟹ New Word
dis appear disappear

The meaning of dis is the opposite of. The meaning of appear is to come into view.

Prefix + Baseword ⟹ New Word
dis appear disappear
(the opposite of) (to come into view)

The meaning of disappear is ______________________________.

11. Find the sentence next to ☐ 11 which says that the heron flies across the pond.

Draw what the sentence says in the box.

Another sentence says:

In the morning air, the heron flies with flapping wings to find more food on the other side of the pond.

Draw what this sentence says in the box.

Do both sentences say the same thing? Circle one: Yes No

12. Note: When you come to a word that you don't know you can often figure out the meaning of the new word. The words near the new word can help you out. These helping words are called context clues. They are clues, or hints to the meaning of a word. In a sentence by ⌉12, a context clue gives the meaning of produce. Write this context clue on the line below.

    The sun's energy is used by green plants to produce, or

    ____________________ food.

13. Note: A context clue can be more than one word.

    Use more than one word to tell the meaning of producers when you finish this sentence.

    Producers are ____.

14. The topic sentence of the passage marked ⌉14 is:

    Green plants produce, or make their food from the sun's energy.

    Note: A sentence that helps to organize, or hold detail sentences together is called a topic sentence. A topic sentence might also be called a passage organizer.

    Most of the detail sentences of the passage ⌉14 tell about the topic: how green plants make food. Find two sentences in passage ⌉14 that do not tell how green plants make food. Write the sentences on the lines below.

    a. ____

    ____

    b. ____

    ____

15. The first four sentences of passage] 15 give the meaning of *consumers*. Read these sentences and then give your own definition for *consumers*. Your definition should have one or two sentences.

Consumers are ____

____

____

16. Note: A prefix is a word part that can change or add to the meaning of a word. The word *composers* has had the prefix *de* put before it to make the word *decomposers*.

Composers are those who *put parts together into a whole thing*. The prefix *de* can mean *to undo*, or *do in reverse.*

What is the meaning of decomposers as used in the sentence by] 16?

____

____

17. The word *enrich* has the prefix *en* at the beginning. *En* has been put before the base word *rich* to add to the meaning of rich. In the word enrich, *en* means *to make*.

As used in the sentence by] 17, what does the word enrich mean?

____

18. Check (✓) the sentence that says the same thing as the sentence marked] 18 in the book.

    ( ) a. Decomposers cover the earth with dead plant and animal bodies.

    ( ) b. Decomposers keep the earth from being covered with dead plants and animal bodies.

19. Write (c) next to the names of consumers. Write (p) next to the names of producers. Write (d) next to the names of decomposers.

_____pine tree

_____lettuce

_____lion

_____you

_____grass

_____cow

_____worm

_____fish

_____algae

_____robin

_____bread mold

_____whale

20. Find the context clue for predators. What are predators?

____

____

Note: A context clue to the meaning of a word may be a whole sentence.

21. Draw yourself as a predator. Write the name or names of your prey.

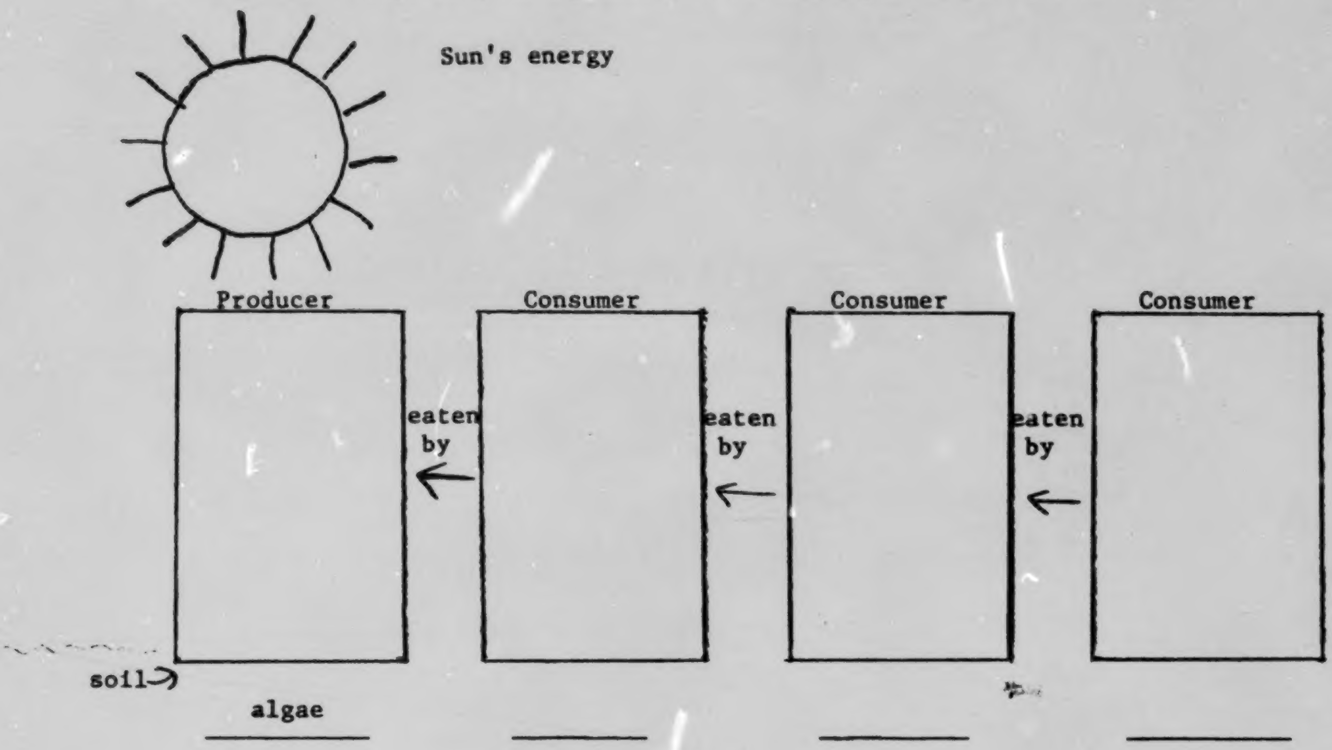
Prey

____

____

____

22. Draw the steps of passing energy from the algae to the heron.


Sun's energy
Producer
Consumer
Consumer
Consumer
eaten by
eaten by
eaten by
soil
algae

23. The topic of the passage marked] 23 is: passing along food energy. Find the topic sentence of the passage] 23. Write it on the line below.

Remember: A topic tells what a passage is about in a few words. A topic sentence is an organizer of a passage. The passage information is organized to tell about the topic.

24. Write a word on the line to finish the sentence.

The circle of a food chain is not complete without matter set free by ________________________________.

Note: The sentence above tells the central thought of the passage marked] 24. The central thought of a passage is more than the topic. The central thought is sometimes called the main idea.

25. The passage marked] 25 tells the meaning of the word ecosystem. A definition of ecosystem is given in one sentence. A definition of a word often follows is or are. Finish the definition.

An ecosystem is ________________________________

____

____

Many examples of ecosystems are given in passage] 25. Name some examples on the lines below.

______________ ______________ ______________

______________ ______________ ______________

______________ ______________ ______________

26. When plants and animals are found living together in a certain environment, what could you say about them? Check (✓) two:

( ) The plants and animals living there depend on each other for energy.

( ) The plants and animals choose to pass on energy to their friends.

( ) The plants and animals live there because they are suited to that environment.

( ) Most plants and animals can live in any environment.

Arctic Tundra Ecosystem

27. Write the context clue that defines (gives the meaning of) tundra.

____.

28. Write two words on the lines to finish this conclusion for the passage marked ⏋ 28.

A five-inch willow tree can grow in ______________ and

______________ weather.

29. The writer says that the wind is blowing. But no large trees bend or pine needles rustle in this wind. Why? ______________

____.

30. Study this passage about the lemming and the white fox. Which sentence best tells about the relationship between the two animals?

Circle one:

a. A white fox is a hamster-like animal.

b. Smaller animals hunt larger animals for food.

c. A lemming will often hunt the white fox.

d. A white fox will often hunt a lemming.

31. The lemming does not stay in its burrow. What animal eats the little lemming? ______________________________________.

32. You will have to look at several paragraphs for the information you will need for this activity. The activity will help you to learn the order, or sequence of when things happened. First read the question. Then look for the sentence in the passage which will help you answer the question. The words when, until, then, as soon as, after, and while will help you. Circle a or b:

A. When does the bear widen the hole?

a. before the seal pops up.

b. before he sniffs seal.

When does the bear whack the seal?

a. before he widens the hole.

b. after he widens the hole.

What does the bear do after he whacks the seal?

a. He widens the seal hole.

b. He drags the seal onto the ice.

When do the two ravens eat the seal's remains?

a. while the fox eats the seal.

b. before the fox eats the seal.

What does the fox do last?

a. eats seal meat.

b. goes to sleep.

B. Put the sentences below in order by numbering each sentence.

1. The bear whacks the seal over the head. _____

2. The fox follows a polar bear. _____

3. The bear eats the seal meat. _____

4. The arctic hare is eaten by a snowy owl. _____

5. The bear goes to sleep. _____

6. The fox goes to sleep. _____

7. The bear waits at the seal hole. _____

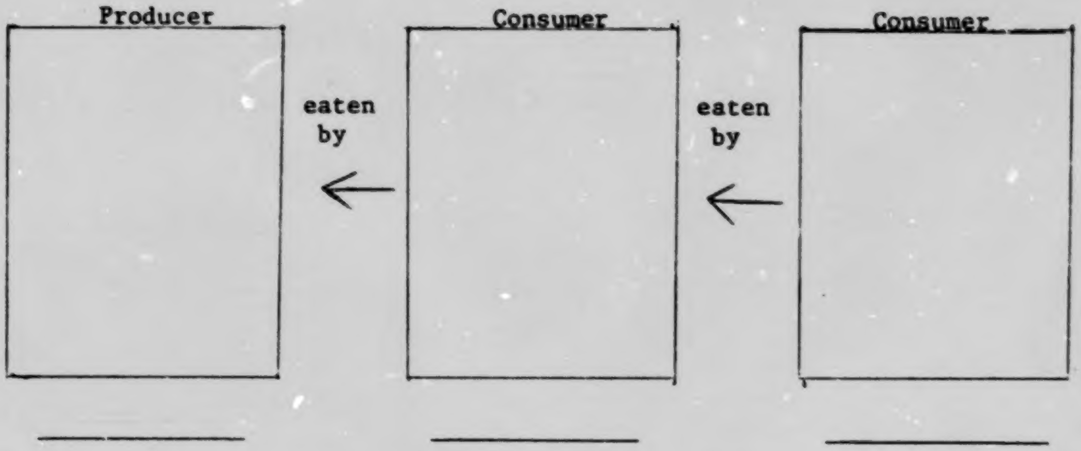
8. The fox and two ravens eat seal meat. _____

33. The sentence marked]33 tells about the hare and the willow. Which sentence below says the same thing as the sentence in the reader? Check one (✓).

( ) The hare must leave the tundra because of plants like the willow.

( ) The hare is able to live on the tundra because of plants such as the willow.

34. Using the information from the passage marked]34, draw an Arctic tundra food chain.



35. A holly bush needs lots of water and warm weather to survive. Will you find a holly bush on the Arctic tundra? Check one: Yes ( ) No ( ).

Why? ______________________________.

36. The meaning of preparation is given by a context clue. This context clue is signalled by a comma and the word or (preparation, or). Write the context clue which defines, or tells the meaning of preparation.

____

37. Some of the information in the passage marked] 37 is about how trees change. Other information is about how animals change. Put the information from the list below under the right heading. Some of the information will not belong under either topic.

Information

Leaves change colors.
There are oak trees in the forest.
Animals are active again.
Leaves bud in spring.
Deer grow warm winter coats.
Trees lose their leaves.
Many animals sleep during the winter.
There are four seasons.

Topics

Trees Change	Animals Change
1. ______________________	1. ______________________
2. ______________________	2. ______________________
3. ______________________	3. ______________________

Note: The information adds to the topic, plants and animals change. Both information and topic add to the central thought. The central thought is the whole idea of how plants and animals change when seasons change.

38. Write the topic of passage] 38 in a few words.

____.

39. The central thought of passage ⏋39 is about plants and how some animals use plants for food and a place to live. List some information from the passage that "add up to" the central thought. Put the information under the correct headings.

About Plants	How Animals Use Plants
1. ____________________	1. ____________________
2. ____________________	2. ____________________
3. ____________________	3. ____________________

40. The word when is a cue word used in a sentence to tell what happens while the leaves, nuts, and fruits fall. Find this cue word and write what happens at the same time. ____________________

____.

41. Put a (✓) by the sentence that says the same thing as the sentence marked ⏋41.

( ) A tree is used by the red-tailed hawk for nesting or as a perch when looking for prey.

( ) A nest in a tree is used as a prey when the red-tailed hawk is looking for a perch.

42. In the food chain described in passage ⏋42, the predator would be the ______________ and its' prey would be the ______________.
Note: You may wish to look again at the context clues for predator and prey. The meanings of these words can be found near the markers ⏋20 and ⏋21 in the reader.

A Grassland Ecosystem

43. The information in passage ☐43 tells about the topic: there are few trees on a prairie. Find the sentence that states this topic. Write it on the line.

____

____

44. The sun rises in the morning. Some animals become active at this time. Some animals "turn in" or start to rest in the morning. What can you say about animals being busy during the day or at night?

Some animals are busy ______________________________.

Some animals are busy ______________________________.

When is a buffalo busy?

____

45. A very short context clue tells you something about pronghorns. They are like another animal. This animal is a ______________. You must know what ____________ are like to know what pronghorns are like. Draw what a pronghorn might look like.

46. There are two main parts in this sentence.

Seeing a moving form in the grass, the pronghorn turns and speeds away.

(1) Seeing a moving form in the grass--and--(2) the pronghorn turns and speeds away.

The two parts can be moved around. Write one of the following words on the line to finish the sentence below. (the, to, soon, after)

The pronghorn turns and speeds away ____________ seeing a moving form in the grass.

Does this sentence say the same thing as the sentence above?

Check one: (✓) Yes ( ) No ( )

47. What is another name for a prairie wolf? ____________________.

48. Information in this paragraph describes, or tells you about a coyote. Use the information to describe this animal in your own words. (Hint: Tell what the coyote looks like, eats and where it lives.)

49. You are told that prairie dogs are plump, foot-high rodents. Rodents are mammals that grind or chew things with their teeth. Squirrels, beavers and rats are rodents. Write what a prairie dog is by explaining what a rodent is. (Remember - The words is or are are often used when defining something.)

Draw your idea of a prairie dog.

50. The passage marked] 50 says that burrowing, or living in tunnels is a way of life for many grassland animals. Why is this so? Two pieces are needed to answer this question.

1. What is it like on the prairie? Write the sentence from the passage that tells about the prairie.

____

____

2. What is it like in a burrow? Write two sentences from the passage that tell about a burrow.

____

____

____

____

Now answer the question above to tell why burrowing is a way of life for many prairie animals. ______________________________

____

To think about:

People of long ago called the "cavemen" lived in caves. Like a burrow, a cave makes a better home than a grassy bank by a pond. Why?

____

____

____

51. The land of burrow-diggers is where animals who dig burrows live. Where is this? ____.

52. To make a burrow, an animal digs a hole. What animal does not make its own burrow? ____________________ Why is this animal like a bandit, or thief? ____.

53. Read the sentence marked ⌉ 53 about when animals dive into their burrows.

Put a (✓) in the box next to the sentence below that says the same thing.

( ) When danger is near, they dive into burrows before their eyes and ears warn them.

( ) Animals dive into burrows after their eyes and ears warn them of danger nearby.

54. Read each sentence. Write on the line below which animal is the predator and which is the prey.

1. They preying mantis eats a grasshopper.

   predator ______________ prey ______________

2. The jackrabbit is eaten by the coyote.

   predator ______________ prey ______________

3. The kit fox is about to attack a small gopher.

   predator ______________ prey ______________

4. A prairie dog is caught by a hawk.

   predator ______________ prey ______________

A Desert Ecosystem

55. What may be left behind or caused by raging rivers?

56. One sentence in the passage marked] 56 tells you that water can be found in the desert. This sentence states the topic. The other sentences give information about where the water is. Write the topic sentence on the line.

57. Write the short context clue that defines the word, peccaries.

Draw your idea of a peccary.

58. How are some cacti adapted to a dry, hot climate?

____

____

59. Name three creeping, crawling animals.

1. ____
2. ____
3. ____

60. Write the sentence which you feel best states the topic of the passage marked] 60.

____

61. The road-runner did two things to a rattlesnake.

1. Jumped on it and pounded it with its bill.
2. Swallowed it.

Which of these two things happened first?

Circle one: No. 1 No. 2

Which of these happened next?

Circle one: No. 1 No. 2

Find the word that gave you the signal about when these two things happened. ____

62. Find the sentence in the reader about birds and sleep. Write a word on the line to make this sentence say the same thing.

Many birds sleep ____________________ it becomes dark on the desert.
before when then

63. The kangaroo rat takes a dust bath. What does it do next? (Remember: the word then is a signal that tells about order, or when things happen.) ______________________________

____

So Different Yet So Much the Same

64. Study the passage] 64. All ecosystems are alike in many ways. Name some of these ways.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________

65. Are human beings consumers or producers of energy? ______________

Where do they get this energy? ______________________

66. Culture is a word that means many things. We keep adding to its meaning as we learn more about people living in groups. Name a few things that are part of a group's culture. ______________

____

____

67. Name three types of cultures you will study.

1. ______________________________

2. ______________________________

3. ______________________________

68. Put the details under the proper heading. Look in the passage for these details.

Details

clear land

hunt wild animals

air pollution

grow crops and raise animals

gather berries

use tools and machines to make cars

are farmers

only simple tools

food chains are broken

energy is used up quickly

Hunting and Gathering

Agriculture

Industry

THE KALAHARI: A Desert Ecosystem

ACTIVITIES

Name____________________

School____________________

The Kalahari: A Desert Ecosystem

1. Not all plants and animals can live on this desert. Lizards are found on the Kalahari desert but fish are not found there.

   What can you say about lizards but not about fish?

   ____

   ____

2. What are dunes? ____

   Dunes are found on deserts. Dunes are also found on seashores. How do you suppose dunes are made? Dunes are made by blowing __________.

3. Few trees have adapted to live in this hot, dry desert.

   The name of one tree which can stay alive there is the ______________ tree. Why are most trees not able to live there? __________________

   ____

4. Draw your idea of a baobob tree.

5. What is the meaning of germinate? ______________________________

____

Note: When , or comes after a word, the meaning of the word often follows. For example, germinate, or -----.

One could tell the meaning of germinate in other ways. Finish each of these sentences.

1. When seeds germinate ____

____

2. Germinate means ____

3. To germinate is ____

6. Name two places where some Kalahari desert plants store water.

1. ________________________

2. ________________________

7. Name some consumers of plants.

____

Name some consumers of animals.

____

8. What do animals need more often than plants? ____________________

Finish this sentence to say the same thing as the sentence marked ☐8.

Animals need water more often than plants, but ________________

____

9. Circle the letter by the sentence which most nearly says the same thing as sentence]9 in the reader. Sentence]9 is about animals finding water.

   a. All animals find water in the same way.
   b. Animals do not stay alive because they find water in different ways.
   c. Animals stay alive because they use many different ways to find water.
   d. Animals stay alive but do not find water by trying different ways.

10. The details in the passage marked]10 tell about the topic: animals find water to stay alive.

    Write a sentence from the passage that states the topic.

    ____

11. Quench means to satisfy.

    How could a lion quench its thirst? ______________________

    How would you quench your thirst? ______________________

    How would an insect or lizard quench its thirst? ______________

    ____

12. A tortoise is a land turtle. You might want to find a picture of a tortoise. Draw what you think a tortoise would look like.

13. When would there be frost on the desert? ______________________

____

____

14. Write a word on the line to finish the sentence.

Flowers sprout, or ______________________________
(hibernate spoil germinate)
when the rains come.

15. Write two words next to the word drought which give the meaning of drought. ______________________________

16. The passage marked]16 is about water or rain.

Information in the passage tells about three topics.

1. Finding and Storing Water.
2. When the Rain Falls.
3. When the Rain Stops.

The list below gives information about rain and water.

Information

small ponds form
travel is nearly impossible
people lap dew
tortoises carry water
water holes dry up
flowers bloom
insects eat plants
antelopes carry canteens
drought returns
grass turns green
desert life awaits the rain
ostriches travel to waterholes
seeds sprout
predators drink the blood of their prey

Write the information under the right heading.

Be careful! Some will not belong anywhere! Use the passage to guide your thinking.

Finding and Storing Water
1. ____________________
2. ____________________
3. ____________________
4. ____________________

When the Rain Stops
1. ____________________
2. ____________________
3. ____________________
4. ____________________

When the Rain Falls
1. ____________________
2. ____________________
3. ____________________
4. ____________________

17. The Bushmen were driven from their homeland in South Africa.

Why did other groups want their homeland? ________________

Why do you think that the Bushmen were safe on the Kalahari?

____

____

18. The Bushmen are not like most African groups. A word part called a prefix has been added to like to make the word unlike. Unlike means not like.

What is the meaning of the prefix un in the word, unlike? __________
Write a sentence of your own on the lines below using the word, unlike.

____

____

____

19. Find another word in the passage with the prefix un. ____________________

What does this word mean?

_______________ means _____ ______________________________.

20. The sentence marked ⌋ 20 says that Bushmen don't plant crops or herd animals. Does this sentence say the same thing as the sentence in the reader?

> The desert is a harsh place to live because the Bushmen don't grow crops of plants or raise animals.

Circle one: Yes No

If you circled No, write a sentence in your own words that does say the same thing.

____

____

____

21. A sentence marked] 21 gives one reason why food chains are not broken by the Bushmen. What might upset or break food chains?

____

____

22. Two sentences by] 22 tell the meaning of migrate. Write the meaning of migrate in one sentence of your own. Use information from both sentences by] 22. ______________________

____

____

23. The prefix re can mean again or back. In the sentence] 23 renew means ______________________________________.
In this sentence the prefix re means __________ in the word renew.

24. What would a Bushman expect to find when he moves to a new place?

____

____

25. The sentence marked] 25 says that ostrich eggshells are decorated. Does this sentence say the same thing as sentence] 25?

Decorated ostrich eggshells are stacked in a pile nearby.

Circle one: Yes No

If you circled No, write a sentence in your own words that does say the same thing as the sentence in the story.

____

____

____

26. The passage marked ┘26 tells what a werf looks like. Some of the information tells about the houses. Some of the information tells about storing water. Tell what you would see at a werf in a few sentences of your own. Use some information about houses and some information about storing water.

____

____

____

27. When do you think a Bushman would not build a skerm?

____

____

Draw a Bushman sleeping overnight on a trip across the desert.

28. What might a Bushman carry in his leather bag?

______________ ______________ ______________

______________ ______________ ______________

______________ ______________ ______________

29. In the sentence marked ┘29, two words tell the meaning of karass.
Write these two words on the line. ______________________

30. Name two places where some ostrich egg shell beads might be seen on a woman. ______________________ ________________

If you do not see beads on a woman, does this mean that she has no beads?

Circle one: Yes No

Where could they be? ____________________________________

31. The sentence by the marker ⊐ 31 says that a Bushman can find water. Choose a phrase from below. Write it on the line to make this sentence say the same thing as the sentence by ⊐ 31.

Other people would ________________________________

for food or water where Bushmen do.

Phrases

think to look

not think to look

search around

32. Describe four places where a Bushman may find water, but where someone else may not look.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

You have just found information which tells where the Bushmen find water. Information can also tell what, how, why, when, who and how much. Now find information that tells how a Bushman gets water from tsama melons and sip wells.

tsama melons ____

____

sip wells ____

____

What kind of work is it? ______________________________________

Why does a Bushman do this work? ______________________________

Information is parts that tell you more about the whole thing. These parts tell you about the central thought, or main idea. The information in the passage ___] 32 tells how Bushmen _______________

____

Find a sentence in the passage that best states the central thought, or what the information is about. Write it here.

____

33. Circle one word in the sentence. The information of the passage marked ___] 33 tells [how / when / what / who] the bushmen eat.

34. Write a sentence from this paragraph that does not tell about getting and fixing plants for food. ______________________________

____

35. Write the topic of the passage marked] 35 in two or three words.

____

36. The men will go hunting ________________ the arrows are made.
before after

Before and after are cue words. Cue words help you to figure out the order of when things happen. Another cue word is when.

The animal finally falls when the poison from the deadly arrow has crept through its body.

Can you cross out any words in these sentences and write in when? The first sentence is done for you.

My teeth hurt ~~as soon as~~ I eat mongongo nuts.
when

We will sing and dance because we are happy.

Do you feel sad after you kill an antelope?

37. Write the sentence below in a different way. Tell about the food first and the hunter last. Do not use the word when in your sentence.

When the hunters bring home the antelope, it means plenty of food.

Write your sentence here.

____

____

38. Which sentence best states the central thought of the passage marked ⌋ 38? Draw a line under one.

Killing an antelope means sharing the meat.

Killing an antelope may mean a feast with singing and dancing.

Killing an antelope means they believe in the hunt.

39. Extra Challenge!

a. In what way do Bushmen believe that stars are like themselves?

____

b. Why do Bushmen believe that hunting is the best way to live?

____

c. What might make Bushmen lose the belief in their way of living?

____

d. What if a group of people lost their belief in their way of living?

____

40. Does this sentence say the same thing as the sentence beside the marker ⌋ 40?

Much of the meat will dry out in the sun before the feast begins and the meat is cut. Circle one: Yes No

41. Finish this sentence to say the same thing as the sentence in the reader next to the marker ⌉ 41.

The regular way for Bushman to hunt ____________________

____

42. This passage tells how to catch an antbear. Pretend that you are a Bushman boy or girl. Pretend that you will tell a visitor how to catch an antbear.

How to Catch an Antbear

Here is information. Number them in order.

( ) kill it with a spear or club
( ) build a fire at the mouth
( ) find a burrow
( ) the animal tries to get out
( ) close off the exits

Here are some cue words.

after, first, then, when, as soon as, next, while

Write the directions on the lines below.

Write your own sentences using information and some of the cue words from above.

____

____

____

____

43. Extra Challenge! Do you like to give directions? Give someone directions to the next waterhole. Try to draw a map. (Hint: What markers would you look for on the desert? How do you suppose Bushmen know where they are?)

Write your directions on the next page and draw your map in the space below the lines. Use information from your reader, cue words, and your imagination.

Directions to the Next Waterhole

____

____

____

____

____

____

____

____

____

44. When do the Bushmen gather termites for food?

____

____

45. Put a word on each line. This sentence should say the same thing as the sentence in the reader next to the marker ⊐45.

__________ the rainy season, a Bushman may remember __________ a green plant grew and go __________ to look for food.

46. Which of the following best states how territory helps one survive.

Check one.
( ) a. A person will wander across his territory in search of food and water.
( ) b. A person who knows where to look for food and water is in his territory.
( ) c. A person who does not know where to look for food or water is in his territory.
( ) d. Once outside your territory, you will be better able to survive because you know the land.

47. What could you do to find out what a group believes about its environment? ____

____

48. The central thought for this story explains why the moon changes. Can you state the central thought by finishing this sentence.

The Bushmen believe that ____

____

____

49. Why do Bushmen feel close to the animals of the Kalahari?

____

____

How could one learn about this feeling? ____________________

____

50. Finish this sentence about Mantis.

The Bushmen believe that Mantis is now ________________ but

was once ____________________.

Do the sentences below say the same thing as the sentences next to

☐ 50? Check one (✓) Yes ( ) No ( )

Mantis is a magical insect with human powers. He once was a person.

51. According to the myth, when did Mantis steal the fire? __________

____

52. What is one of the "ways of Bushmen"? ____________________

____

53. Explain the central thought of the myth, Mantis and Firebird.

(What is it about?) ______________________________

____

____

Note: The central thought may be stated in a topic sentence. But sometimes you must tell more about the topic to give the central thought.

54. The beliefs of a hunting and gathering culture show ______________

____

55. Why are there few hunting and gathering groups today?

____

____

56. A hunting and gathering group lives on the Kalahari desert. What does this tell you about this environment?

____

____

THE ISLAND OF JAVA: A Tropical Ecosystem

ACTIVITIES

Name ______________________________

School ____________________________

GROWING RICE IN JAVA

ACTIVITIES

The Tropical Ecosystem

1. What is the topic of the passage marked ⏋1?

   Check one: ( ) The island of Java.
   ( ) The islands of Indonesia.
   ( ) Volcanos make the soil rich.
   ( ) The state of New York is like Java.

2. Which of the following best describes why most Indonesians live on the island of Java?

   Check one: ( ) More people will live where there are volcanos.
   ( ) More people will live on an island the size of New York.
   ( ) More people will live where the soil is rich.
   ( ) People will live where it is very beautiful.

3. The words in the sentence marked ⏋3 tell the meaning of humid.

   a. Finish the sentence with the meaning of humid. Humid air is

   ____

   b. What word pointed out, or signaled this clue to the meaning of humid?

   ____

4. A meaning for the word monsoons can be figured out from the sentence marked ⏋4. Finish the two sentences below by adding words to tell the meaning of monsoons.

   a. Monsoons are ______________________________________

   ____

   b. Monsoons, or ______________________________________

   ____

Note: The meaning of a word can be given in more than one way.

5. The environment includes soil and climate. Information in passage ⌉5 is about moisture and temperature. What part of the environment does this information describe? a. ______________________________

Write the topic of passage ⌉5 in a few words.

Note: You do not need to write a sentence, only a few words.

b. ____

6. On Java, plants grow:

Check one: ( ) in summer.

( ) in the dormant season.

( ) all year.

7. There is not much variety, but rather a sameness, to the climate of Java. Is this true about the plant life of Java? ____________________

8. Without light there would be no color. Without light tells the cause of something. Where there is no light there is no color. No color is the effect or result. Draw a circle around the cause of something in this sentence. Draw a line under the effect.

Sunlight shines down on the forest, and it is alive with color.

9. Which of the following best states the topic of passage ⌉9?

Check one: ( ) sunshine on Java.

( ) birds on Java.

( ) plants on Java.

( ) colors on Java.

10. A pine tree is an evergreen that does not have broad leaves. Why is a pine tree called an evergreen?

____

____

11. Three words tell what lianas are. Write these words on the line.

Lianas are________________________________

Details are also given to tell more about lianas.

Name two parts of the tree where lianas grow.

1. ________________________________

2. ________________________________

Where do they begin life?

3. ________________________________

How do they grow toward the sun?

____

4. Write about the lianas on the lines below. Tell the meaning of lianas in two or three sentences of your own.

____

____

____

____

____

12. An epiphyte such as the wild orchid can grow anywhere on a tree.

Where are some of these places? ______________________________

The epiphytes get moisture from the air. Most plants get moisture from the ground. How would you describe the air on Java?

____

13. Draw what you think the author means by green giants.

14. Finish the sentence using clues to the meaning of bamboo.

Bamboo plants have ______________ ______________ stalks

which can be made into ______ _______ or ______________.

15. The information about flowers and bamboo in the passage marked ⏋15 tell about the topic:

____

Note: The topic is given for you in one of the sentences in the passage.

16. Finish the following sentence so that it says the same thing as the sentence marked ⏋16. Use your own words.

An eagle is very quiet as it zooms down _______________________

____

Which animal is the predator? ________________________________

17. The topic of passage ___ 17 is clearly stated in a topic sentence. Find the topic sentence. Then state the topic in a sentence of your own.

____

The information tells about two groups of animals. One group of animals are monkeys. The other animals are all ____________________. The central thought adds these to the topic. The central thought is more than the topic. Help to write the central thought.

____________________ and ______________________ are two groups of animals found among the many forest animals.

18. Snakes, lizards and frogs eat insects.

What else do they eat? ____________________________________

19. Why do some animals kill other animals?

____

20. The horizon is the line where the earth seems to meet the sky. What time of day would "when the sun dips below the horizon" mean?

Check one: ( ) morning

( ) noon

( ) evening

( ) midnight

21. The prefix non means not, or the opposite of. What does nonliving mean? ______________________________

Note: A prefix changes the meaning of a base word.

22. When a monkey eats a banana, what has been passed on to the monkey?

23. Write three words near the word copra that give its meaning.

24. A rice paddy must be flat enough to hold water. In Java, land on hills is made into terraces for rice growing. A terrace is like a flat platform of earth. The author says that terraces look like ______________ going up the sides of ______________________.

25. The climate helps to determine what crops grow in a place. What kind of climate do coconut trees, rubber trees, and coffee plants need?

PEOPLE OF JAVA

26. What is the short definition given for culture in the sentence marked] 26?

27. The Javanese are traditional farmers. They do not use new ways or methods of doing things.
Two sentences in your reader define the meaning of traditional. Study these sentences and write your own definition of traditional farming.

28. A domesticated animal is not wild. It is ________________________.

Put an X by domesticated animals found in your ecosystem.

fox cow chicken horse

giraffe water buffalo deer

Name some other domesticated animals________________________________

29. Gotong-rojong and plowing paddies with water-buffaloes are old ways of doing things. These are examples of ____________________________

30. The topic of this passage of 4 paragraphs marked] 30 is that:

Many people on Java are traditional rice farmers.

Here is information fron the passage.

Water buffaloes have long curling horns.

This information does not tell about rice farming. Find another example from the passage which is not about rice farming. Write it here.

____

____

Write three examples of information which do describe rice farming on Java. (Choose each from a different paragraph.)

1. ____

2. ____

3. ____

31. Finish this sentence to say the same thing as the sentence marked ⌉31.

Irrigation ditches bringing water from a stream close by have to be fixed ____ .

Extra Challenge:

Say the same thing as the sentence marked ⌉31 in two sentences of your own. (Use the cue word first in one sentence and the cue word next or then in the second sentence.)

____

____

____

32. Write a cue word on the line to finish the sentence.

(cue words: first, then, next, until, when)

They will stop plowing __________ the soil becomes soft and muddy.

33. Transplant means to dig up and plant in another place.

What does sentence ⌉33 say must happen before the baby rice plants can be transplanted?

____

What cue word in your reader helped you answer this question? ________

34. In the sentence marked ⌉34, what do the farmer and his wife do as the rice grows? ______________________________

A cue word should have helped you answer this question. This cue word lets you know that two or more things happen at the same time. For example: I watched the water buffalo while eating my lunch. The cue word used in this sentence and in the sentence marked ⌉ 34 is ______________________.

Now use this cue word in two sentences of your own.

1. ______________________________
____

2. ______________________________
____

35. The sentence in the passage marked ⌉ 35 describes the work of growing rice. Help to complete these details. Write a word on each line.

The paddies must be free of ____________________.

Little children make noise to keep the ____________ away from the rice plants.

The older ____________________ help in the afternoon.

The farmer and his ______________ must keep working.

What is the effect of all this work? Find the sentence near the end of the passage that tells the result or effect of this careful care of rice plants. Write it here. ______________________________
____

What can you say about rice growing in general? Help to write this sentence by putting a word on each line. Use words from the last sentence of passage ⌉35.

One must __________ __________ __________ of rice plants for them to __________ __________ in the paddy.

36. A farmer's community is the people of his village. Each helps the community by sharing water, animals and tools. This helping and sharing are examples ____________________________________.

Hint: Look again next to]29 in the story and at activity 29.

37. The sentence marked]37 says:

As soon as the rice grows tall and yellow, a long row of workers moves across the field.

You could say:

When the rice grows tall and yellow, a long row of workers moves across the field.

Note: As soon as and when are called cue words. Cue words tell the order of when things happen.

Circle the words in the box which would make sense in the sentence below:

Cue Words

next
soon
during
last
then
while
finally

A long row of workers __________________ moves across the field when the rice is tall and yellow.

38. Holding the ani-ani in the palm of one's hand is a ________________.

What do you suppose the Javanese expect if the rice god is happy?

____

Cue Words

next
then
later
soon
finally
until
while
when
as soon as
after
during
meanwhile

Read: The irrigation ditches are fixed and then the rice can be planted.

The cue word then is not the only word which can be used in this sentence.

You could use the cue words soon, next, or finally in place of then. The meaning would not change.

Select a word from the box which makes sense in each sentence below. Write the word on the line.

1. ______________ the farmers let water into their fields.
2. ______________ they harness the water buffaloes and plant.
3. ______________ the fields are ready, the tiny plants can be planted.
4. ______________ the plants are growing.
5. ______________ the farmer must pull out the weeds.
6. The rice is harvested ____________________ it tall and yellow.
7. First the stalks are laid in the sun ___________________ they are dry and _____________________ threshing begins.
8. _______________________ the rice is stored in jars or baskets.
9. A feast ____________________ may be held.

Extra Challenge!

Write a different word which you could have used in the sentences.

1. ________ 2. ________ 3. ________ 4. ________

5. ________ 6. ________ 7. ________ 8. ________ 9. ________

40. Finish the sentence by writing one of the endings listed below on the line.

When a Javanese person eats a papaya, he or she is part of

____.

a. an agricultural food chain.

b. a rice food chain

c. a natural food chain.

41. Name two ways the Javanese have changed their environment.

1. ____

2. ____

42. What does the information of this passage tell about? Write the topic in a few words. ______________________________

The most important part of Javanese houses is the roof. What would be the least important part of the house? ______________

Why? ____

43. Read] 43, then in your own words tell someone how to batik a piece of cotton. Use the cue words first, next, then, as soon as, finally. (Don't worry if you can't use all of them but use as many different ones as you can.

____

____

____

____

____

44. A Javanese woman in traditional dress would put her groceries of rice, bread, and fish in her ____________________ which is a ____.

45. Which is traditional, the turban or the pitji? ________________.

46. The word refreshing contains the prefix re at the beginning. The prefix re means again. Refreshing means to become __________ ____________________________.

47. Sometimes the climate, or weather is the chief cause of a part of our culture. Cool cottons are worn in hot climates. Warm woolens and furs are worn in cold climates.

Name some things that the Javanese do because of the climate.

____

____

____

48. What is one thing you would expect to do at a selamatin?

____

49. The dalang gets things ready for the shadow play. Name four cue words used to show the order of these events.

_______ _______ _______ _______

What happens after the cloth is spread over a wooden frame but before the puppets are removed from a box.

____

50. What will make shadows on the cloth? ______________________________

51. The dalang can change his voice. Why does he do this?

52. The children are sent to bed early. Circle one: Yes No.

Write the sentence in the passage marked] 52 that helped you answer this question.

Write a sentence in your own words that says the same thing as the sentence in the passage. (Do not use the word before.)

53. Who told the mouse-deer to find the Raja's drum?

54. Did Pelanduk want to share the plums? ______________________________

55. What looked like a drum is really a ______________________________

56. Does this sentence say the same thing as the sentence marked] 56?

Circle one: Yes No

Covered with wasps, Pelanduk jumped over the river while the tiger watched on the riverbank.

57. **Draw four different things that happen in the passage marked ┘ 57. Show the order, or sequence of when they happen. Write a topic above each drawing.**

Topic: ______________________

FIRST

Topic: ______________________

NEXT

Topic: ______________________

LATER

Topic: ______________________

FINALLY

58. People change ecosystems when they grow crops and raise animals. How do they do this? List some information for this central thought.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________

NEW ORLEANS: A Cypress Swamp Ecosystem

ACTIVITIES

Name ______________________

School ____________________

INDUSTRY IN NEW ORLEANS

A Cypress Swamp Ecosystem

1. What is a cypress? ______________________________

   What is a swamp? ______________________________

   Put these two word meanings together to define in your own words a cypress swamp. ______________________________

   ____

   ____

2. What is the weather like in a tropical climate? __________

   ____

   How is a subtropical climate different from a tropical climate?

   ____

   In the word subtropical, the prefix sub means:

   Check one ✓ ___under or below

   ___not quite, somewhat

   ___forming or being a division

3. Does the information of the passage marked] 3 describe the animals and plants of this ecosystem or the climate of this ecosystem?

   Check one ✓ ___plants and animals

   ___climate

   Write the topic in a few words.

   ____

4. When did the animals begin to make noise? ____________________

5. Many details about limpkins are given in the passage marked]5.

   Help to find these details.

   a) What is a limpkin? ______________________________

   b) What words told you the kind of animal a limpkin is?

   ____

   c) Limpkins are waders. This means they ________________,

   or walk through water.

   d) Limpkins have __________ over their bodies like all

   birds.

   e) Where do vultures roost, or rest? ____________________

   Are the limpkins roosting on treetops too? __________

   f) What sound did the raccoon hear?____________________

6. Hammocks are found in the cypress swamp. What are they? In your own words, write a definition (one or two sentences) of a hammock.

   ____

   ____

7. You read about bread mold when you read about life at the pond. Another kind of mold is stated in the sentence marked

   ]8. Mold is a __________________.

   Check one ✓

   _____ producer

   _____ consumer

   _____ decomposer

8. Finish this sentence about raccoons.

   Before they go to sleep, the raccoons __________________

   ____.

9. The passage marked ⌉9 tells you in many ways that it is early in the morning. Write these clues to the time of day described in the passage.

For example:

1. dawn is on its way
2. the sky lightens
3.______________________________
4.______________________________
5.______________________________

10. The passage marked ⌉ 10 tells about what is happening during the middle of the morning. It also tells about things which had happened earlier in the morning.

Write mid-morning after things happening in the middle of the morning.

Write early morning next to earlier events.

a. Alligators sun themselves.__________________________
b. Dewdrops dried up.__________________________
c. Birds were feeding.__________________________
d. A water moccasin hangs from a branch.__________________________
e. Night-blooming flowers have closed their petals. ____________
f. Birds sang their songs. __________________________
g. Birds are gathering twigs. __________________________

11. The prefix re can mean again or back.

What does rebuilding mean in this passage? ____________________

____

12. Find the sentence marked]12 about two ospreys.

Put a ✓ in the box next to the sentence that says the same thing as the sentence in the story.

☐ A neighboring tree is built again at the top by two ospreys for a nest.

☐ In a tree nearby, the two ospreys rebuild their nest from the year before.

13. Air plants are called epiphytes. What is the epiphyte named next to]13? ______________________________

Where would you expect to see this epiphyte?

Check one ✓

___in the water among the lilies

___on the ground by bushes

___around tree trunks and branches

14. A fish hawk is a bird that eats fish. A mullet is a ____________

The fish hawk saw a mullet. Why did the fish hawk dive toward the water? ______________________________

15. What do you suppose the beetle is eating? ____________________

The lizard moves onto the same leaf with the beetle. What do you suppose happened to this beetle? ____________________

16. Study the sentence about the lizard eating a beetle in the passage marked 16.

Lizards do not change color because of what they eat. Lizards change color in order to protect themselves from danger. They change color to look the same as their surroundings. Then a predator might not see them. Check one of the following. ( )

☐ The lizard changed from brown to green because it ate a beetle.

☐ The lizard changed from brown to green because it sat on a leaf.

17. Make a link in a food chain for the beetle, lizard and leaf.

Producer	(eaten by) ←	Consumer	(eaten by) ←	Consumer
______		______		______

Draw a picture to show this.

18. What caused the butterfly to leave the leaf? ____________________

____

19. Does the sentence marked ⌉ 19 say that insects and small animals consume ospreys and raccoons? Yes____ No____

20. What are two producers named in the passage marked ⌋ 20.

a.____

b.____

21. Read the sentence marked ⌋ 21 about changes in swamps. Do you agree or disagree with the following: ____agree ____disagree

Things do not change in swamps over many years.

New Orleans: An Agricultural Ecosystem

22. The meaning of palmetto thatch is given in the sentence:

The leaves of this smaller palm tree made sturdy roofing, or thatch.

Finish the definitions below using these clues. Write one word on each line.

A palmetto is a smaller ____________ ______________.

Palmetto thatch is __________ ____________________

made of Palmetto ____________________________.

23. The sentence marked ⌋ 23 tells about the ecosystem when French settlers came.

Check ☑ the sentence below that says the same thing as the sentence in the story.

☐ Very little had been changed of the natural ecosystem before settlers came from France.

☐ A group of settlers came from France after the natural ecosystem had been changed a lot.

24. Wild animals were forced farther back into the forest. When did this happen?____

____

25. When many animals leave their home area or die, what happens to the ecosystem?

Check one: ☑

__ The ecosystem stays the same.

__ The ecosystem disappears.

__ The ecosystem changes.

26. Name three plants that were part of natural food chains when the settlers arrived.

______________ ______________ ______________

27. Did the French settlers mainly adapt to early New Orleans as hunters and gatherers? Yes__ No__

What two things did the early settlers do to adapt to the environment?

1.____

2.____

28. African slaves worked on very large farms called ______________

29. The purpose of some farming is to grow enough for the needs of a family. This was not the purpose of farming on plantations. What was the purpose of farming on large plantations? ______________

____

30. Put these sentence parts in order to make a sentence which says the same thing as the sentence marked ⌉30.

____

____

____

Sentence Parts

where agricultural products are stored

are warehouses

down the Mississippi River.

after having traveled by rafts

Next to the river

31. The town of New Orleans was mainly a place to ________________ goods.

grow   recycle   trade

32. The central thought of the passage marked ⌉32 can be stated as follows:

The natural ecosystem of the area was changed and wealth was built up by activities of early settlers.

Name the three activities stated in the passage which caused this.

1.____________________________________

2.____________________________________

3.____________________________________

33. What helped manufacturing and industry to begin in New Orleans?

____

____

New Orleans: Now an Industrial Ecosystem

34. Name two things that have helped make New Orleans a trading center.

a. ______________________________

b. ______________________________

35. Why does industry still depend upon the environment?

____

____

36. Name three things from this environment changed into finished goods. Name the finished product too.

From the Environment	Finished Product
1. ______________	1. ______________
2. ______________	2. ______________
3. ______________	3. ______________

37. The topic of the passage marked] 37 is: farming is now an industry.

Add to the topic to state the central thought of the passage.

Farming is now a part of industry because ______________

____

38. Extra Challenge:

The passage marked] 38 is about people using the environment. You have read how people in the past have used their environments for hunting, gathering, and raising crops. Today, raising crops is part of industry. What other way of using the environment is now a part of industry. (1 word) ______________.

39. People today take many of the same things from the environment by fishing, hunting and gathering as the Indians and settlers. How is the use of the environment today different from earlier times?

Find a sentence in passage] 39 that answers this question best.

Write it on the line.____

____

40. A natural environment has been changed very little by people.

An artificial environment is ________________________________

____

____

____

41. Name two things that happen to animals when a city is built.

1.____

2.____

42. Water and air that is not clean is ______________________________

43. Recycled materials are reused, or used again. What does the prefix re mean in the word recycled?

____

44. The passage marked] 44 explains another problem caused by man changing the environment. Explain this problem in one or two sentences of your own. This should be the central thought of the passage.

____

____

____

45. Swamps were drained to make dry land. Why was this done?

____

46. Levees are high banks of sand-filled bags or other materials. How are they helpful?

a)____

How are they harmful?

b)____

47. Why will they drain more land?

____

What will happen to the land after it is drained?

____

What will happen to pipes and sidewalks as the land sinks?

____

48. What must planners do before land is drained?

____

____

49. Finish this sentence to state the central thought of passage] 49.

Because draining wetlands causes damage to the environment,

planners ____

____

____

50. **Extra Challenge!**

People want to save parts of the natural environment and have clean air and water. But people also want land for homes and factories for jobs. Because hurting the environment is part of an industrial culture, what must people do?

Check ✓ the best conclusion.

- __ People must decide to have pollution because they need jobs.
- __ People must decide not to drain swamps because it damages the environment.
- __ People must choose ways to use land, air and water that will not do a great deal of damage to the environment.
- __ People must choose ways to harm the environment because pollution is what the people want.

New Orleans: The City of Mardi Gras

51. What is the topic described in the passage marked ___] 51?

____

The information of the second paragraph in passage ___] 51 defines the word Mardi Gras with facts. These are facts about what Mardi Gras is. The other paragraph has details to tell an idea of what Mardi Gras is like. The purpose of these details is to get you to

_____________________ Mardi Gras in your mind.

How does the author describe what Mardi Gras is like? (What would you picture in your mind?)

____

____

____

52. Name three materials used to decorate the costumes.

a.____________________________

b.____________________________

c.____________________________

53. In the French Quarter, a person might walk home on the ____________ and then sit on the _________________________ after dinner.

54. Write a context clue to define rebuilt. Use the meaning of the prefix re in your definitions.

____

____

____

55. Find the sentence which best states the central thought of passage ⌋ 55. This sentence should tell about the mixing of cultures in New Orleans.

____

____

Write one sentence from the passage that is an example of the central thought stated above.

____

56. Finish the sentence below to define the word superstition.

A superstition is ______________________________

____

57. The prefix mis can mean wrong, wrongly, bad, or badly. In the sentence marked ⌋ 57, what does misfortune mean? ____________

____

Write a sentence of your own using the word misfortune. ________

____

____

58. Select a word below to finish this conclusion.

At one time or another, all groups have had ______________.

a. voodoo.

b. charms.

c. witches.

d. superstitions.

59. For Fun!

Write a superstition you may have heard. (Finding a four leaf clover brings good luck.)

____

____

Make up a story about how this came to be.

____

____

____

____

____

____

Make up a bit of Black Magic, a good luck charm, a cure, or a taboo.

____

____

____

____

60. Check the best conclusion below.

Since people have become closer to machines and science, they have become ________________________________

___a. more superstitious.

___b. better adapted to natural food chains.

___c. less superstitious.

___d. more interested in witches.

APPENDIX C

LIST OF SKILLS PER ACTIVITY

Environmental Readers
Classification of Activities
Level E - Skills/Objectives

OBJECTIVES

Life in Ecosystems

1. Paraphrase
2. Central Thought
3. Word Meaning - Context Clues - Relationships - Conclusions (Inference)
4. Word Meaning - Context Clues
5. Sentence Meaning - Detail - Central Thought
6. Sequence - Sentence Meaning - Detail
7. Sentence Meaning - Detail
8. Relationships - Conclusions (Inference)
9. Relationships - Conclusions (Inference)
10. Word Meaning
11. Sentence Meaning - Paraphrase
12. Word Meaning - Context Clues
13. Word Meaning - Context Clues
14. Central Thought
15. Word Meaning - Context Clues
16. Word Meaning - Prefixes
17. Word Meaning - Prefixes
18. Sentence Meaning - Paraphrase
19. Word Meaning - Context Clues Inference
20. Word Meaning - Context Clues
21. Word Meaning - Context Clues - Central Thought
22. Central Thought
23. Central Thought
24. Central Thought
25. Word Meaning - Context Clues

Objectives (cont.)

53. Sentence Meaning - Paraphrase

54. Word Meaning - Context Clues

55. Sentence Meaning - Detail

56. Central Thought

57. Word Meaning - Context Clues

58. Sentence Meaning - Detail - Relationships - Conclusions

59. Sentence Meaning - Detail

60. Central Thought

61. Sequence

62. Sequence - Sentence Meaning - Paraphrase

63. Sequence

64. Central Thought

65. Word Meaning - Context Clues - Relationships - Conclusions

66. Word Meaning - Context Clues

67. Sentence Meaning - Detail

68. Central Thought

OBJECTIVES

The Kalahari: A Desert Ecosystem

1. Relationships/Conclusions
2. Word Meaning - Context Clues
3. Relationships/Conclusions (Inference)
4. Central Thought
5. Word Meaning - Context Clues
6. Sentence Meaning - Detail
7. Sentence Meaning - Detail
8. Sentence Meaning - Paraphrase
   Sentence Meaning - Detail
9. Sentence Meaning - Paraphrase
10. Central Thought
11. Word Meaning - Context Clues
    Sentence Meaning - Detail
    Relationships - Conclusions
12. Word Meaning - Context Clues
13. Sentence Meaning - Detail
14. Word Meaning - Context Clues
15. Word Meaning - Context Clues
16. Central Thought
17. Relationships/Conclusions (Inference)
18. Word Meaning - Prefixes
19. Word Meaning - Prefixes
20. Sentence Meaning - Paraphrase
21. Relationships/Conclusions (Inference)
22. Word Meaning - Context Clues
23. Word Meaning - Prefixes

Objectives (cont.)

24. Relationships/Conclusions

25. Sentence Meaning - Paraphrase

26. Central Thought

27. Relationships/Conclusions (Inference)

28. Sentence Meaning - Detail

29. Word Meaning - Context Clues

30. Relationships/Conclusions

31. Sentence Meaning - Paraphrase

32. Central Thought

33. Central Thought

34. Central Thought

35. Central Thought

36. Sequence

37. Sequence

Sentence Meaning - Paraphrase

38. Central Thought

39. Relationships/Conclusions (Inference & Interpretation)

40. Sentence Meaning - Paraphrase

41. Sentence Meaning - Paraphrase

42. Sequence

43. Sequence

44. Sentence Meaning - Detail

45. Sentence Meaning - Paraphrase

46. Relationships - Conclusions

47. Relationships - Conclusions

48. Central Thought

49. Sentence Meaning - Detail

Objectives (cont.)

50. Sentence Meaning - Paraphrase
51. Sentence Meaning - Detail
52. Sentence Meaning - Detail
53. Central Thought
54. Sentence Meaning - Detail
55. Sentence Meaning - Detail
56. Relationships/Conclusions

OBJECTIVES

Java

1. Central Thought
2. Relationship - Conclusions
3. Word Meaning - Context Clues
4. Word Meaning - Context Clues
5. Central Thought
6. Relationship - Conclusions (Inference)
7. Sentence Meaning - Detail
8. Relationships - Conclusions
9. Central Thought
10. Word Meaning - Context Clues
    Relationships - Conclusions
11. Word Meaning - Context Clues
    Sentence Meaning - Detail
12. Sentence Meaning - Detail
    Relationship - Conclusions
13. Interpretation
14. Word Meaning - Context Clues
    Sentence Meaning - Detail
15. Central Thought
16. Sentence - Meaning - Paraphrase
17. Central Thought
18. Sentence Meaning - Detail
19. Sentence Meaning - Detail
20. Inference
21. Word Meaning - Prefixes
22. Sentence Meaning - Detail
    Relationships - Conclusions

Objectives (cont.)

23. Word Meaning - Context Clues

24. Word Meaning - Context Clues

    Sentence Meaning - Detail

25. Relationships - Conclusions (Inference)

26. Word Meaning - Context Clues

27. Word Meaning - Context Clues

28. Word Meaning - Context Clues

    Relationships - Conclusions

29. Word Meaning - Context Clues

    Relationships - Conclusions

30. Central Thought

31. Sentence Meaning - Paraphrase

    Sequence

32. Sequence

    Sentence Meaning - Paraphrase

33. Sequence - Sentence Meaning - Detail

34. Sequence

35. Relationships - Conclusions - Sentence Meaning - Detail

36. Word Meaning - Context Clues

37. Sequence

38. Sentence Meaning - Detail

    Inference

39. Sequence

40. Sentence Meaning - Detail

    Relationships - Conclusions

41. Central Thought

42. Central Thought Inference

43. Sequence - Sentence Meaning - Paraphrase
44. Word Meaning - Context Clues
45. Word Meaning - Context Clues
46. Word Meaning - Prefixes
47. Relationships - Conclusions (Inference)
48. Word Meaning - Context Clues
49. Sequence
50. Sentence Meaning - Detail
51. Sentence Meaning - Detail
52. Sentence Meaning - Paraphrase
    Sequence
53. Sentence Meaning - Detail
54. Sentence Meaning - Detail
55. Relationships - Conclusions (Inference)
56. Sentence Meaning - Paraphrase
57. Sequence - Central Thought
58. Central Thought

OBJECTIVES

Industry in New Orleans

1. Word Meaning - Context Clues

   Sentence Meaning - Paraphrase

2. Word Meaning - Prefixes

3. Central Thought

4. Sequence

   Sentence Meaning - Detail

5. Word Meaning - Context Clues - Sentence Meaning - Detail

6. Word Meaning - Context Clues

   Sentence Meaning - Paraphrase

7. Relationships - Conclusions (Review)

8. Sentence Meaning - Paraphrase

   Sequence

9. Central Thought

10. Sequence

11. Word Meaning - Prefixes

12. Sentence Meaning - Paraphrase

13. Word Meaning (Review)

    Relationships/Conclusions (Inference)

14. Relationships/Conclusions (Inference)

15. Word Meaning - Context Clues (Inference)

16. Relationships/Conclusions

17. Sequence

18. Sentence Meaning - Detail (Inference)

19. Sentence Meaning - Paraphrase

20. Sentence Meaning - Detail

21. Sentence Meaning - Paraphrase

22. Word Meaning - Context Clues

23. Sentence Meaning - Paraphrase

24. Sequence

25. Relationships - Conclusions

26. Relationships - Conclusions

27. Central Thought

28. Word Meaning - Context Clues

29. Relationships/Conclusions

30. Sentence Meaning - Paraphrase

31. Sentence Meaning - Detail

32. Central Thought

33. Sentence Meaning - Detail

34. Sentence Meaning - Detail

35. Sentence Meaning - Detail

36. Central Thought

Sentence Meaning - Detail

37. Central Thought

38. Central Thought

39. Central Thought

40. Word Meaning - Context Clues - Prefixes

41. Sentence Meaning - Detail

42. Word Meaning - Context Clues

43. Word Meaning - Prefixes

44. Central Thought

45. Sentence Meaning - Detail

46. Sentence Meaning - Detail

47. Sentence Meaning - Detail

48. Sentence Meaning - Detail

49. Central Thought

50. Central Thought

Objectives (cont.)

51. Central Thought
52. Sentence Meaning - Detail
53. Word Meaning - Context Clues
54. Word Meaning - Context Clues and Prefixes
55. Central Thought
56. Word Meaning - Context Clues
57. Word Meaning - Prefixes
58. Relationships - Conclusions
59. Central Thought
60. Relationships - Conclusions (Inference)

APPENDIX D

ANSWER KEYS

LIFE IN ECOSYSTEMS

ANSWER KEY

Answers - Life in Ecosystems

1. a. There is an opening among the trees, and the land there is a bit higher and dryer.
   b. Sample answer: The land is high and dry in the opening among the trees.

2. (Any six) trees, grass, cattails, bushes, ferns, mosses, green algae, blue-green algae.

3. top Sample answers: air underwater, underwater, or under the surface beetle.

4. top, surface

5. animals, in the pond. They are noticeable because they are large. Sample answer: Many larger animals live in the pond.

6. after hatching

7. eats, growing

8. the bluegill

9. beak of the great blue heron. He was eaten by the heron first.

10. the opposite of to come into view or to go out of view.

11. (drawings) Yes

12. make

13. green plants or green plants that make their own food

14. a. The plant then becomes food for insects and larger animals.
    b. Green plants, the producers, range in size from tiny algae to giant trees.

15. Sample answer: living things that cannot make food from the sun's energy. They depend on food-producing plants.

16. Decomposers are consumers that undo the parts of a whole thing.

17. to make rich or to make the soil rich

18. (✓) b

19. p pine tree
p lettuce
c lion
c you
p grass
p cow
d worm
c fish
p algae
c robin
d bread mold
c whale

20. Predators are consumer animals that kill other animals before or during the process of eating them.

21. (drawing)

22. (drawings) algae bluegill tadpole algae

23. Food energy passes from living thing to living thing.

24. decomposers

25. a group of living and nonliving things that depend on each other and on their environment.
(nine) earth, forests, grasslands, deserts, ponds, lakes, streams, rivers, seas, oceans, terrarium, acquarium

26. (✓) The plants and animals living there depend on each other for energy.
(✓) The plants and animals live there because they are suited to that environment.

27. A tundra is a flat stretch of land without large trees.

28. cold, windy

29. It is a treeless plain. (No trees)

30. d

31. the ermine

32.

A.	B.
a	3
b	1
b	4
a	8
b	5
	7
	2
	6

33. (✓) The hare is able to live on the tundra because of plants such as the willow.

34. (drawings) (either) willows - hare - snowy owl (or) sea plants - seal - bear

35. No (✓) Only plants which can live on little water and stand cold weather are adapted to the Arctic tundra.

36. getting ready

37.

Trees Change	Animals Change
1. Leaves change colors.	1. Animals are active again.
2. Leaves bud in spring.	2. Deer grow warm winter coats.
3. Trees lose their leaves.	3. Many animals sleep during the winter.

38. water in the forest

39. (Answers will vary)
    Plants (any 3)
    1. There are many plants.
    2. There are hickory trees, spring flowers, small trees, and bushes.
    3. The sun shines on treetops.
    4. The sun filters down to smaller plants.
    5. Upward and outward grows the greenery.

    Animals Use Plants (any 3)
    1. Upward and outward come the forest feeders.
    2. Squirrels and chipmunks gather acorns and nuts.
    3. Insects feed on leaves.
    4. Birds nest in trees.

40. Some of the animals begin storing food for the winter.

41. (✓) A tree is used by the red-tailed hawk for nesting or as a perch when looking for prey.

42. hawk, squirrel

43. A prairie is a grassland environment, and there are trees.

44. during the day, at night, during the day

45. deer, deer (drawing)

46. after (✓) Yes

47. coyote

48. Sample answer: The coyote has a bushy tail and large pointed ears. He eats gophers, ground squirrels and jackrabbits. He hunts at night and lives in a den.

49. Sample answer: Prairie dogs are rodents. Rodents are mammals that gnaw things with their teeth.

50. 1. The prairie is open to view, wind, and weather.
    2. A burrow is snug and dry. It is a perfect place to hide young animals from hungry eyes or spend a cold winter.

    Sample answer: A burrow protects animals from weather and predators.
    Sample answer: A cave would protect people from weather and predators.

51. prairie

52. ferret
It steals the burrow of its prey. (It steals the burrow of another animal.)

53. (✓) Animals dive into burrows after their eyes and ears warn them of danger nearby.

54.

Predator	Prey
1. preying mantis	grasshopper
2. coyote	jackrabbit
3. kit fox	gopher
4. hawk	prairie dog

55. deep canyons and narrow gullies

56. Small amounts of water, however, can be found in the desert at one place or another.

57. wild, piglike animals

58. Sample answer: They have thick tough outer layers to keep them from drying out.

59. (any three)
lizard
rattlesnake
insect
iguana

60. By early dusk the crawling and creeping animals come out. or (At afternoon's end the desert plants begin to cast long shadows, and the animal life begins to stir.)

61. (No. 1) (No. 2) Then

62. when

63. Gathers seeds for dinner.

64. (any six)
1. All have producers.
2. All have consumers.
3. All have living and non-living parts.
4. All have food chains.
5. All have decomposers.
6. All depend upon the sun's energy.
7. The parts are linked together.
8. The parts form a system.

65. Consumers
    plants and animals (food)

66. beliefs, tools, science, language, dress

67. hunting and gathering, agricultural, industrial

68. Hunting and Gathering
    hunt wild animals
    gather berries
    only simple tools

    Agriculture
    clear land
    grow crops and raise animals
    are farmers
    food chains are broken

    Industry
    air pollution
    use tools and machines to make cars
    energy is used up quickly

THE KALAHARI:
A Desert Ecosystem

ANSWER KEY

Answers - The Kalahari: A Desert Ecosystem

1. Lizards don't need much water. OR
   Lizards can live where there is little water.

2. rolling hills of sand
   sand

3. baobob
   They don't store water. OR
   They are not adapted to the hot dry climate.
   They don't have spongy wood.
4. (drawing)

5. Start to grow
   1. they start to grow.
   2. to start to grow
   3. to start to grow.

6. 1. trunk; 2. roots

7. consumers of plants
   antelope, zebras, giraffes, insects (ants)

   consumers of animals
   lizards, snakes, lions, lepoards, vultures

8. water
   they can move around to find it.

9. c.

10. But animals, like plants, must have water to survive. OR
    Animals trying to stay alive find water in many different ways.

11. 1. on the flesh and blood of its prey.
    2. Sample: Drink soda pop, water, orange juice
    3. lap dew

12. (drawing)

13. During June and July. OR During the cool months.

14. germinate

15. dry times

16. Finding and Storing Water

    1. tortoises carry water
    2. insects eat plants
    3. ostriches travel to waterholes
    4. predators drink the blood of their prey

    When the Rain Falls

    1. small ponds form
    2. flowers bloom
    3. grass turns green
    4. seeds sprout

    When the Rain Stops

    1. Travel is nearly impossible
    2. Waterholes dry up
    3. drought returns
    4. desert life awaits the rain

17. They wanted to raise cattle on the rich grasslands.
    It is not rich grassland but dry desert land. It is not a good place to raise cattle.

18. not

19. unusual

    unusual means not usual

20. No
    Sample answer: Because the desert is not good for farming, the Bushmen do not farm.

21. Taking more than is needed from the environment might upset food chains.

22. Migrate means to move or not stay in one spot.

23. to make new again
    again

24. food and water

25. No
    Sample answer: Decorated ostrich eggshells are placed carefully into rows.

26. Sample answer: At a werf you will see cone-shaped houses made of sticks and grass. You would see decorated eggshells which hold water.

27. Sample answers: When he does not plan to stay long. When traveling across the desert.

28. Ostrich eggshell, arrowheads, a knife, a pipe, tobacco.

29. a big cape

30. Around her neck. . .around her head.
No--in her karass or in the folds of her cape.

31. not think to look

32. 1. tsama melons
 2. bi and ga roots
 3. wild cucumbers
 4. sip wells

tsama melons -- Make a hole, mash inside with a stick and drink.
sip wells -- Dig with a reed into the sand and suck water.
Hard (work)
To get water. Water is all important.
find water
A Bushman can find water where no one else would think to look.

33. what

34. The sun is not yet up, but it is already hot on the Kalahari.

35. fixing poison arrows or preparing arrows.

36. after
because
  when
after
  when

37. Sample answer: There is plenty of food (after, as soon as, because) the hunters bring home the antelope.

38. Killing an antelope may mean a feast with singing and dancing.

39. a. They are both hunters.
 b. It keeps them alive.
 c. They could lose this belief if they no longer could hunt or find game to keep alive.
 d. They might lose the strength they need to live.

40. No

41. antelope and other large animals is to use poisoned arrows.

42. (5) Sample answer: First, find a burrow. After you close
 (3) off the exits, build a fire at the mouth. As soon
 (1) as the animal tries to get out, kill it with a spear
 (4) or club.
 (2)

43. (Map drawing)

44. during the rainy season OR
when they develop wings during the rainy season and swarm from their nests.

45. after
where
there (back)

46. (✓)b. A person who knows where to look for food and water is in his territory.

47. Study their songs, dances and stories.

48. Sample answer: the sun chases the moon across the sky and shoots off slices of the moon with flaming arrows.

49. They share territory and food chains.
Listen to, or read their stories.
(OR)
Study their culture.

50. an insect
a person
(✓) Yes

51. When the firebird lifted his wings.

52. Sharing

53. Sample answer: An insect called Mantis stole the fire of the Firebird and shared it with people.
OR
People have fire to use for cooking, warmth and light because Mantis, an insect, stole it from the Firebird, an ostrich.

54. A closeness to the environment.

55. Most people practice agriculture, or farming.

56. It may not be a good environment for agriculture.
The environment may not be suited for agriculture.

THE ISLAND OF JAVA:
A Tropical Ecosystem

ANSWER KEY

Answers: Java

1. (✓) The island of Java.

2. (✓) More people will live where the soil is rich.

3.a. heavy with moisture
  b. or

4. a. strong winds(which carry heavy rains.)
   b. strong winds(carry heavy rains.)

5.a. climate (weather)
  b. climate and soil (of Java)

6. (✓) all year

7. No

8. Sunlight shines down on the forest
   it is alive with color

9. (✓) plants on Java

10. The leaves do not change color and fall to the ground.

11. Large woodyvines
    1. about the trunks
    2. among tree branches
    3. on the forest floor
    4. quickly (twist and coil)
    (Sample) Lianas are plants which grow around the trunks and branches of trees. They are large woody vines which grow rapidly towards the sun.

12. tree trunks, branches, leaves
    The air on Java is moist.
    (damp, wet, humid)

13. (drawing of large trees)

14. thick hollow
    fishing poles
    furniture

15. (Many) other plants

16. Sample answer: from the sky to kill a macaw.
    eagle

17. Sample answer: Many animals live in the forest.
birds
monkeys
birds

18. each other

19. in order to live (for food)

20. (✓) evening

21. not living
or
the opposite of living
or
dead

22. energy

23. dried coconut meat

24. steps   hills

25. wet and warm (tropical)

26. beliefs and ways of doing things.

27. Sample answer: Traditional farming means farming with the same tools and methods that were used in the past.

28. tame
cow, chicken, horse

29. traditions

30. (Examples)
The Javanese live and work in many ways.
Javanese work in factories, offices, tea and rubber farms.
Some Javanese are teachers.
Domesticated animals have been tamed by people.
They look much like overgrown cows.
In spite of their gentle nature, water buffaloes are very powerful.

Second Part: 1.
2. any of the information in the remaining sentences
3.

31. before the rice can be planted.
Sample answer: First the irrigation ditches which carry water from a stream close by are fixed. Then the rice can be planted.

32. when

33. The paddies must be ready.
when

34. While
Sample answers: I watched television while eating my lunch.
Herbert was scared while riding the roller-coaster.

35. weeds
birds
children
wife
Almost every plant grows well in the paddy.
take good care, grow well

36. gotong-rojong or their traditions

37.

[✓ next]
[✓ soon]
during
last
[✓ then]
while
[✓ finally]

38. tradition
a good crop, plenty of rice

39. Answers will vary. Do your sentences make sense to you?

40. a natural food chain

41. a. cleared land
b. irrigated fields

42. Houses of Javanese farmers
sides

43. Sample answer: The climate is warm, year around. The sides may be palm or bamboo screens.
Sample answer: First take some cotton material. Next, pour wax over the cloth in designs. Then dye the material. As soon as the dye soaks through, take it out of the dye. Finally, remove the wax.

44. Selandang
long, thin piece of cloth

45. turban

46. fresh again

47. go barefoot
    take many baths
    change clothes often

48. feast, or eat

49. first, then, next, finally
    The dalang hangs a lamp behind the cloth.

50. puppets

51. To give each puppet its own way of speaking.

52. No
    But young or old, no-one thinks of going to bed before the play is over.
    (Answers will vary.)
    After the play is over, everyone goes home to bed.

53. the hummingbird

54. No

55. wasp's nest

56. No

57. (drawings)

58. (Answers will vary.)
    land is cleared
    roads are built
    homes are built
    animals are forced to move
    sompe plants and animals die out
    food chains are broken
    there is no longer a balance

NEW ORLEANS:
A Cypress Swamp Ecosystem

ANSWER KEY

Answers: Industry in New Orleans

1. kind of a tree
   wet, spongy land which may be covered with water in some places.
   Sample answer: A cypress swamp is wet, spongy land where cypress trees grow.

2. The weather is warm and there is plenty of rainfall.
   It is not as hot and the temperatures are not the same all year long.
   ☑ not quite, somewhat

3. ☑ climate
   a subtropical climate

4. at (since) sundown

5. a. a bird
   b. the Indians call them "crying birds". A raccoon heard the birds too.
   c. wade
   d. feathers
   e. on treetops
   no
   f. Kree-ow

6. Sample answer: A hammock is an island of twisted roots and leaf mold. Many trees and animals live on this island in the swamp.

7. ✓ decomposer

8. curl up into balls.

9. All at once it is daybreak.
   Only the night animals are quiet now.
   The many forest animals begin their daily duties.

10. a. Mid-morning
    b. early-morning
    c. mid-morning
    d. mid-morning
    e. early-morning
    f. early-morning
    g. mid-morning

11. build again

12. ☑ In a tree nearby, the two ospreys rebuild their nest from the year before.

13. Spanish moss

    ✓ around tree trunks and branches

14. fish

    to catch or eat the mullet

15. the leaf

    the lizard ate it

16. The lizard changed from brown to green because it sat on a leaf.

17.

Producer	Consumer	Consumer
leaf	beetle	lizard

18. The lizard made the leaf move.

    (The lizard scared the butterfly.)

19. ☑ No

20. Cypress trees

    water lilies

21. ☑ disagree

22. palm tree.

    sturdy roofing

    leaves

23. ☑ Very little had been changed of the natural ecosystem before settlers come from France.

24. This happened when the settlers cleared land, dug ditches and built huts where the animals had lived.

25. ☑ The ecosystem changes.

26. rice

    tobacco

    indigo

27. ☑ No

    1. cleared land
    2. grew crops

28. plantations

29. To grow crops to sell.

30. Next to the river are warehouses where agricultural products are stored after having traveled by rafts down the Mississippi Rivers.

31. trade

32. 1. Trees were cut for lumber.
    2. Animals were trapped for fur.
    3. Extra crops were sold.

33. The wealth built up from agriculture and trade.

34. a. Mississippi River
    b. the ocean

35. Sample answers: Farm, forest and mineral products are needed to turn into finishing goods.
OR
(They depend on the environment for farm, forest and mineral products.)

36.

From the Environment	Finished Product
1. Cotton bolls	1. Cotton cloth
2. Sugar cane	2. Sugar
3. Animal hides	3. Leather

37. machines are used to plow, plant and harvest crops on very large farms.

38. gathering

39. Much more of the environment is used by many more people.
OR
People today take more than they need for themselves.

40. one made by people

41. 1. Many animals are destroyed.
    2. Many animals become pests.

42. polluted

43. again

44. Sample answer; The land of New Orleans sank because it was not firm enough to hold a city.

45. Sample answer: People needed dry land on which to build.

46. a. They keep ocean, lake and river water out.
    b. They keep rain water inside the city.

47. Sample answer: People still plan to build on the low wet lands.
It will sink.
Sidewalk will crack and pipes will burst.

48. Planners must make environmental impact statements.

49. Sample answer: prepare "environmental impact" statements before land is drained.

50. ☑ People must choose ways to use land that will not do a great deal of damage to the environment.

51. Mardi Gras
imagine, see, picture
Sample answer: Beautiful colors, happy, laughing faces, dancing feet, waving arms, shining floats, marching jazz bands.

52. a. feathers
b. sequins
c. beads

53. banquettes, sidewalks
galleries, balconies, porches

54. The buildings were built again.

55. The blending of French and Spanish cultures in New Orleans is known as the Creole culture.
(One of the following)
The new French Quarter looked very Spanish!
Creoles were the sons and daughters of the French and Spanish setters who were born in this country.
In the French Quarter today we can hear the French language and eat creole cooking.

56. a belief which explains why things happen or gives tips on how to make something.

57. bad fortune (badluck)

58. d. superstitions

59. (Answers will vary.)

60. ☑ C

APPENDIX E

CONTENT COMPREHENSION TESTS

TEST ADMINISTRATOR'S DIRECTIONS FOR TEST 1

LIFE IN ECOSYSTEMS

Test Conditions

Time

The estimated total time for the first test, "Life in Ecosystems," is 40 minutes. The other three tests are estimated to take about 30 minutes. These time estimates are given for planning purposes only. Each student should be allowed as much time as needed to finish each test.

Materials

Each student will need:

a sharpened no. 2 pencil with an eraser

a cleared desk top

a content posttest of the reader section just completed

an answer sheet for marking answer choices.

Directions for Administering

1. Directions to be read to the students are in italics. Directions to the test administrator are in regular type. Do not add to the directions, but repeat the ones given if requested to do so.

2. *You are going to take a test about environments. I will give you a test booklet and an answer sheet. Do not write on the test booklet but do write your name, school and the date on the answer sheet.*

3. Distribute the tests and answer sheets.

4. Read the following instructions:

   At the top of the answer sheet you will see a list of the section titles of the reader. Draw a circle around the title of the section you just finished reading. This test will be about what you read in that section. For this test you should draw a circle around "Life in Ecosystems." Now open the test booklet to the example question. Read the question silently while I read it out loud. Read the example question below to the students.

   Example question

   An ecosystem is a set of plants and animals that

   A. defend the environment for food.
   B. depend on each other for food.
   C. hurt the living and nonliving parts.
   D. can live in many different environments.

5. *Find the box on the answer sheet for the example question. Mark your answer by filling in one of the circles with your pencil.* **(pause)** *You should have filled in circle B.* **Read aloud the example question with the correct answer. (B).**

6. *The rest of the test is like the example we just did but from now on you will work alone. Read each question. Mark each answer on your answer sheet by filling in the circle for your answer choice. When you come to a word you do not know, raise your hand and I will help you with pronunciation. When you are not sure of an answer, mark the answer you think is correct. Be sure to match the number of each question with the same number on the answer sheet. When you finish the test, put your answer sheet inside the test booklet. You may read a library book until everyone is finished. You may begin now.*

7. **Record the time students begin and the time when all finish the test below.**

Time: ____________________________

Time: ____________________________

LIFE IN ECOSYSTEMS

CONTENT TEST

Example question

An ecosystem is a set of plants and animals that

A. defend the environment for food.

B. depend on each other for food.

C. hurt the living and nonliving parts.

D. can live in many different environments.

Life in Ecosystems

Content - Post Tests

1. The bluegill, sunfish, bass, watersnake and tadpole all live

   A. in algae.
   B. in bright sand nests.
   C. in water.
   D. in trees.

2. May flies, water beetles, dragon flies, and water fleas are all

   A. small pond animals.
   B. great pond animals.
   C. small ocean animals.
   D. little pond plants.

3. A bluegill will eat a tadpole. This is an example of

   A. a smaller animal eating a larger one.
   B. a larger animal eating a bluegill.
   C. how a small tadpole hunts for food.
   D. a larger animal eating a smaller one.

4. The front legs begin to grow. This shows that

   A. a tadpole is swimming to shore.
   B. a tadpole is turning into a frog.
   C. a frog is eating algae.
   D. a tadpole is eating algae.

5. A bluegill does not appear after going down the heron's throat. It has

   A. reappeared.
   B. misappeared.
   C. disappeared.
   D. discovered.

6. When food is eaten, energy is passed on to another living thing.

   Food energy does not

   A. disappear.
   B. misappear.
   C. discover.
   D. appear.

7. Animals that eat other plants and animals are called

   A. producers.
   B. consumers.
   C. algae.
   D. living things.

8. The breaking down of wastes and dead plant and animal bodies is called

   A. hatching.
   B. consuming.
   C. predator.
   D. decay.

9. Waterfleas eat algae. Sunfish eat waterfleas. Watersnakes eat sunfish. This is an example of

   A. getting energy from soil.
   B. a broken food chain.
   C. energy being lost in a food chain.
   D. energy being passed along a food chain.

10. Waterfleas are poisoned by insect spray. Sunfish don't have waterfleas to eat and die out. Watersnakes don't have sunfish to eat. This is an example of how

    A. food chains do not change.
    B. food chains use energy.
    C. food chains can be broken.
    D. food chains are held together.

11. When plants and animals are found living together in an environment you know that

    A. they depend on each other for food.
    B. they pass on energy to their friends.
    C. they can live in any environment.
    D. they depend on finding a dead tree.

12. When mushrooms are found growing on a dead fallen tree you know that

    A. mushrooms can live in every climate.
    B. mushrooms are adapted to a dead tree environment.
    C. mushrooms are consumed by dead trees.
    D. mushrooms need sunlight to make food.

13. A tundra is

    A. a mountain without trees.
    B. a hilly stretch of land with small trees.
    C. a flat piece of land without large trees.
    D. a flat piece of land covered with big trees.

14. A lemming is an

    A. animal like a bear.
    B. animal like a reindeer.
    C. animal like a seal.
    D. animal like a hamster.

15. The bear swats the seal over the head

    A. before he widens the seal hole.
    B. as soon as the seal pops up to breathe.
    C. before the seal pops up to breathe.
    D. after he drags the seal onto the ice.

16. The bear walks away

   A. after he becomes full and sleepy.
   B. when he feasts on fatty blubber.
   C. as soon as the fox trots out.
   D. after he sniffs seal.

17. Hares could not live on the tundra without

   A. willows.
   B. pines.
   C. weasles.
   D. snowy owls.

18. Plants can live through freezing weather on small amounts of

   A. rocks.
   B. water.
   C. air.
   D. wind.

19. A sign of preparation is when

   A. squirrels climb trees.
   B. birds fly fast.
   C. birds build nests.
   D. grass is green.

20. Leaves change colors on

   A. cacti.
   B. dwarf willows.
   C. evergreen trees.
   D. deciduous trees.

21. Little rain, thick sod, grazing, and fires all explain why

   A. the prairie has four seasons.
   B. forests grow well in grasslands.
   C. few trees grow on grasslands.
   D. few plants and animals live in grasslands.

22. Having large grinding teeth and eating grasses shows that bison are

    A. designed, or made to live on the prairie.
    B. tired of eating seal meat.
    C. turning in after a busy night.
    D. adapted to a deciduous forest food chain.

23. Burrowing is a way of life for grassland animals because a burrow

    A. has food and water.
    B. is a safe place.
    C. is large and friendly.
    D. is out of reach in the treetops.

24. Grasslands animals run at great speeds or go into burrows because they must

    A. spot the enemy.
    B. try not to climb trees.
    C. catch their prey.
    D. escape their predators.

25. Predators depend the most upon other

    A. plants.
    B. decay.
    C. forests.
    D. animals.

26. For food, the bison, prairie dog and jackrabbits all depend mainly upon

    A. producers.
    B. consumers.
    C. insects.
    D. roots.

27. A peccarie is a

    A. giant cactus.
    B. pig like animal.
    C. big rodent.
    D. fast-running fox.

28. An iguana is

    A. a giant cactus.
    B. a big rat.
    C. a foot long lizard.
    D. an underground river.

29. The living and non-living parts of all ecosystems work

    A. apart.
    B. together.
    C. once in awhile.
    D. when no one else will work.

30. Ecosystems have living and non-living parts. All have consumers, producers, climate and soil. But ecosystems like the arctic, tundra, prairie, and desert have

    A. too many animals and plants.
    B. very few animals and plants.
    C. different kinds of consumers and producers.
    D. the same kinds of consumers and producers.

31. Hunting and gathering, agricultural, and industrial are three kinds of

    A. cultures.
    B. creatures.
    C. crops.
    D. natural food chains.

32. What happens when land is cleared?

- A. There is no environment.
- B. Farmers live on wild animals.
- C. Food chains break down.
- D. Food chains do not change.

TEST ADMINISTRATOR'S DIRECTIONS FOR TEST 2

THE KALAHARI

Test Conditions

Time

The estimated time for this test is about 30 minutes. Each student should be allowed as much time as needed to finish each test.

Materials

Each student will need:

a sharpened no. 2 pencil with an eraser

a cleared desk top

a content posttest of the reader section just completed

an answer sheet for marking answer choices.

Directions for Administering

1. Directions to be read to the students are in italics. Directions to the test administrator are in regular type. Do not add to the directions, but repeat the ones given if requested to do so.

2. *You are going to take a test about environments. I will give you a test booklet and an answer sheet. Do not write on the test booklet but do write your name, school and the date on the answer sheet.*

3. Distribute the tests and answer sheets.

4. Read the following instructions:

   At the top of the answer sheet you will see a list of the section titles of the reader. Draw a circle around the title of the section you just finished reading. This test will be about what you read in that section. For this test you should draw a circle around "The Kalahari." Now open the test booklet to the example question. Read the question silently while I read it out loud. Read the example question below to the students.

   Example question

   A stamping block is used for

   A. dancing.
   B. printing cloth.
   C. washing clothes.
   D. mashing nuts.

5. *Find the box on the answer sheet for the example question. Mark your answer by filling in one of the circles with your pencil.* **(pause)** *You should have filled in circle D.* **Read out loud the example question with the correct answer. (D)**

6. *The rest of the test is like the example we just did but from now on you will work alone. Read each question. Mark each answer on your answer sheet by filling in the circle of your choice. When you come to a word you do not know, raise your hand and I will help you with pronunciation. When you finish the test, put your answer sheet inside the test booklet. You may read a library book until everyone is finished. You may begin now.*

7. **Record the time students begin and the time when all finish the test below.**

Time: ______________________

Time: ______________________

THE KALAHARI: A Desert Ecosystem

CONTENT TEST

Example question

A stamping block is used for

A. dancing.

B. printing cloth.

C. washing clothes.

D. mashing nuts.

The Kalahari: A Desert Ecosystem

Content Post-Test

1. A tree which is adapted to the Kalahari is the

   A. mamba.
   B. magnolia.
   C. willow.
   D. baobob

2. Which African country has a desert with burning hot summers and cold winter nights?

   A. Rhodesia
   B. Botswana
   C. Ghana
   D. Burma

3. Plants cannot move around to find water but they

   A. do not need water as often as animals.
   B. do not know where to look for water.
   C. do not like water very much.
   D. send seeds out in search of water.

4. Animals that do not consume other animals survive on the Kalahari desert because

   A. predators live there.
   B. vultures live there.
   C. plants grow there.
   D. consumers are there.

5. Waterholes fill up, plants bud, blossom and bear seeds, and animals return to the Kalahari

   A. when the rains come.
   B. when rain stops.
   C. during the drought.
   D. when water freezes at night.

6. Grasses make food. Antelope eat grasses. Lions eat antelope. This shows that

   A. animals are hungry in hot climates.
   B. food chains are broken in hot, dry climates.
   C. the Kalahari desert is very dry and hot.
   D. food chains can exist in hot, dry places.

7. The Bushmen were safe on the Kalahari desert because

   A. big rocks blocked the road.
   B. it is a good place for cattle-raising peoples.
   C. people raising cattle did not want the land there.
   D. they defeated the people wanting to raise cattle.

8. What is most unusual about the Bushmen is that

   A. they have wrinkled, copper colored skin.
   B. they still live as hunters and gatherers.
   C. they have a different language.
   D. they break natural food chains.

9. When ostrich shells are empty, water must be

   A. unturned.
   B. misplaced.
   C. replaced.
   D. returned.

10. Living in one spot on the Kalahari is almost

    A. important.
    B. impossible.
    C. untrue.
    D. in between

11. Where might you find an ostrich eggshell, tobacco, pipe and a knife?

    A. In a skerm.
    B. In a karass.
    C. In a breech cloth.
    D. In a leather bag.

12. Where might you find a baby, food or firewood?

    A. In a karass.
    B. In a skerm.
    C. In a breech cloth.
    D. In a mongongo.

13. An animal will lie down

    A. after it is speared.
    B. after the poison spreads.
    C. as soon as the arrow hits it.
    D. when the hunter pulls his bow.

14. The hunters will follow the spoor

    A. before preparing the arrows.
    B. as soon as the animal lies down.
    C. while the animal runs.
    D. after the animal is dead.

15. When the feast is over, some of the meat is

    A. dried in the sun.
    B. buried in the sand.
    C. given to the dogs.
    D. put into a shell.

16. Bushmen get strength from their belief in

    A. dancing.
    B. singing.
    C. running.
    D. hunting.

17. Termites are like

    A. small rodents.
    B. big caterpillers.
    C. little flies.
    D. large ants.

18. A mamba is

    A. a snake.
    B. a porcupine.
    C. a moth.
    D. a lizard.

19. Because of territory rules,

    A. food energy is lost.
    B. food chains survive.
    C. everyone can hunt anywhere.
    D. food chains are broken.

20. A group's songs, dances, and stories are a part of their

    A. territory.
    B. ecosystem.
    C. culture.
    D. climate.

21. Why do the Bushmen feel close to the animals?

    A. They feel that the sun is a taker of life.
    B. They can run as swiftly as some animals.
    C. They share territory and food chains.
    D. They know that animals will share their food.

22. The Bushmen believe that everything

A. is a part of the same ecosystem.
B. is alive and from one beginning.
C. came from the sun and moon.
D. was once part of one large food chain.

TEST ADMINISTRATOR'S DIRECTIONS FOR TEST 3

JAVA

Test Conditions

Time

The estimated total time for this test is about 30 minutes. Each student should be allowed as much time as needed to finish each test.

Materials

Each student will need:

a sharpened no. 2 pencil with an eraser

a cleared desk top

a content posttest of the reader section just completed

an answer sheet for marking answer choices.

Directions for Administering

1. Directions to be read to the students are in italics. Directions to the test administrator are in regular type. Do not add to the directions, but repeat the ones given if requested to do so.

2. *You are going to take a test about environments. I will give you a test booklet and an answer sheet. Do not write on the test booklet but do write your name, school and the date on the answer sheet.*

3. Distribute the tests and answer sheets.

4. Read the following instructions:

   At the top of the answer sheet you will see a list of the section titles of the reader. Draw a circle around the title of the section you just finished reading. This test will be about what you read in that section. For this test you should draw a circle around "Java." Now open the test booklet to the example question. Read the question silently while I read it out loud. Read the example question below to the students.

   Example question

   A sarong is a piece of material which is wound

   - *A. around the waist.*
   - *B. around the head.*
   - *C. over the shoulders.*
   - *D. around each foot.*

5. *Find the box on the answer sheet for the example question. Mark your answer by filling in one of the circles with your pencil.* **(pause)** *You should have filled in circle A.* **Read out loud the example question with the correct answer. (A)**

6. *The rest of the test is like the example we just did but from now on you will work alone. Read each question. Mark each answer on your answer sheet by filling in the circle of your choice. When you come to a word you do not know, raise your hand and I will help you with pronunciation. When you are not sure of an answer, mark the answer you think is correct. Be sure to match the number of each question with the same number on the answer sheet. When you finish the test, put your answer sheet inside the test booklet. You may read a library book until everyone is finished. You may begin now.*

7. **Record the time students begin and the time when all finish the test below.**

Time: ______________________

Time: ______________________

THE ISLAND OF JAVA: A Tropical Ecosystem

CONTENT TEST

Example question

A sarong is a piece of material which is wound

A. around the waist.

B. around the head.

C. over the shoulders.

D. around each foot.

The Island of Java: A Tropical Ecosystem

1. Seven out of ten Indonesians live on Java because of its
   - A. climate.
   - B. soil.
   - C. size.
   - D. decomposers.

2. In lands at or near the equator
   - A. daylight hours are longer in summer.
   - B. daylight hours are shorter in summer.
   - C. daylight hours stay the same.
   - D. darkness is unusual.

3. Epiphytes are
   - A. air plants.
   - B. water lilies.
   - C. orange flowers.
   - D. large birds.

4. Rafflesia are
   - A. bamboo plants.
   - B. rice plants.
   - C. tall trees.
   - D. giant flowers.

5. Monkeys put on a show. Parrots and cockatoos rustle branches. An eagle kills a macaw. This information shows that
   - A. monkeys are very carefree animals.
   - B. there are too few animals in the forest.
   - C. many plants help animals.
   - D. the forest is full of animal life.

6. Snakes, lizards and frogs fatten up on insects. Many birds and bats enjoy eating from the flowers and the fruit filled trees. Many animals kill other animals in order to live. This information shows that

   A. animals eat too many insects.
   B. animals eat forest plants and other animals.
   C. animals depend only on other forest consumers for food.
   D. all animals eat plants and other decomposers.

7. Rubber, sugar cane, coffee and tea are grown

   A. in pretty paddies.
   B. in the forest.
   C. on cleared lands.
   D. during monsoons.

8. Soil, plants, insects, birds and large animals are parts

   A. of a natural system.
   B. of a hot climate.
   C. of the seasons.
   D. of a culture.

9. Following tradition is using

   A. old ways.
   B. old animals.
   C. new machines.
   D. new fields.

10. An ani-ani is

   A. a large plow.
   B. a long spear.
   C. a small knife.
   D. a sharp scythe.

11. The soil of the rice paddies is plowed

A. during the harvest.
B. before the irrigation ditches are fixed.
C. as soon as the rice is tall.
D. until it becomes soft and muddy.

12. The rice plants are transplanted

A. before the irrigation ditches are fixed.
B. after the fields are plowed.
C. when the fields dry out.
D. before the fields are soft and muddy.

13. While the rice plants are growing,

A. threshing starts.
B. weeds are pulled.
C. the rice gods are angry.
D. rice grains fall to the ground.

14. Winnowing begins

A. before the rice is harvested.
B. before transplanting rice plants.
C. as soon as weeding begins.
D. after the stalks are pounded.

15. The Javanese have adapted to growing rice by

A. living in forests, catching fish, and gathering bananas.
B. clearing land, irrigating fields and moving a lot.
C. moving to cities, planting forests and irrigating villages.
D. clearing land, irrigating fields and living in villages.

16. The house will be dryer, less muddy and cooler when built

A. in a cave.
B. on the ground.
C. above the ground.
D. on terraces.

17. A pitji is a

A. robe.
B. scarf.
C. cap.
D. dress.

18. A sarong is

A. a piece of cloth wound around the waist.
B. a piece of cloth wound around the head.
C. a piece of cloth worn around the neck.
D. used to hold babies or groceries.

19. What would you do at a selamatin?

A. Sing.
B. Eat.
C. Pray.
D. Batik.

20. Sate is

A. fried rice.
B. boiled fish.
C. stewed chicken.
D. barbecued goat.

21. The wasps swarmed the tiger who then

A. jumped into the river.
B. climbed a tree.
C. ate the plums.
D. hit Pelanduk over the head.

22. Pelanduk counted the crocodiles while

A. climbing the tree.
B. jumping from one to another.
C. telling them the emperor's plan.
D. resting on the other bank.

23. People clear land, grow crops and build homes. This is how

A. a forest is saved.
B. animals are protected.
C. ecosystems change.
D. ecosystems end.

24. When land is cleared and only one crop is depended upon

A. people no longer need food chains.
B. people are a part of natural food chains.
C. the environment is not needed.
D. people upset the natural ecosystem.

TEST ADMINISTRATOR'S DIRECTIONS FOR TEST 4
NEW ORLEANS

Test Conditions

Time

The estimated total time for this test is about 30 minutes. Each student should be allowed as much time as needed to finish each test.

Materials

Each student will need:

a sharpened no. 2 pencil with an erase

a cleared desk top

a content posttest of the reader section just completed

an answer sheet for marking answer choices.

Directions for Administering

1. Directions to be read to the students are in italics. Directions to the test administrator are in regular type. Do not add to the directions, but repeat the ones given if requested to do so.

2. *You are going to take a test about environments. I will give you a test booklet and an answer sheet. Do not write on the test booklet but do write your name, school and the date on the answer sheet.*

3. Read the following instructions:

   At the top of the answer sheet you will see a list of the section titles of the reader. Draw a circle around the title of the section you just finished reading. This test will be about what you read in that section. For this test you should draw a circle around "New Orleans." Now open the test booklet to the example question. Read the question silently while I read it out loud. Read the example question below to the students.

Example question

The Tunican Indians who lived along the coast

A. did much to change the environment.
B. made an artificial environment.
C. did little to change the evironment.
D. did not use the land at all.

4. *Find the box on the answer sheet for the example question. Mark your answer by filling in one of the circles with your pencil.* **(pause)** *You should have filled in circle C.* **Read out loud the example question with the correct answer. (C)**

5. *The rest of the test is like the example we just did but from now on you will work alone. Read each question. Mark each answer on your answer sheet by filling in the circle of your choice. When you come to a word you do not know, raise your hand and I will help you with pronunciation. When you are not sure of an answer, mark the answer you think is correct. Be sure to match the number of each question with the same number on the answer sheet. When you finish the test, put your answer sheet inside the test booklet. You may read a library book until everyone is finished. You may begin now.*

6. **Record the time students begin and the time when all finish the test below.**

Time: ______________________________

Time: ______________________________

NEW ORLEANS:
A Cypress Swamp Ecosystem

CONTENT TEST

Example question

The Tunican Indians who lived along the coast

A. did much to change the environment.

B. made an artificial environment.

C. did little to change the environment.

D. did not use the land at all.

A Cypress Swamp Ecosystem

1. Temperatures are not the same all year. The winters are much cooler than the summers. There are occasional hurricanes. There is plenty of rain. This information tells about

   A. a tropical climate.
   B. a temperate climate.
   C. a subtropical climate.
   D. a semiarid desert.

2. Many small plants, bushes and trees grew there. The swamp was a home for countless animals. There were raccoons, rabbits, birds and insects. These details tell about how the swamp

   A. was covered with water.
   B. was full of wild animals.
   C. was designed for plants.
   D. was crowded with wild life.

3. A limpkin is a

   A. bird
   B. fish.
   C. beetle.
   D. snake.

4. A sweet bay is a

   A. bush.
   B. berry.
   C. harbor.
   D. tree.

5. Spanish moss is
    - A. a ground cover.
    - B. an air plant.
    - C. a shrub.
    - D. a Spanish flower.

6. A mullet is
    - A. a bird.
    - B. a hawk.
    - C. a fish.
    - D. an insect.

7. Why did the lizard change from brown to green?
    - A. Green is the lizard's favorite color.
    - B. The beetle it ate was green.
    - C. Predators will only eat green lizards.
    - D. Turning green would protect the lizard.

8. Why did the butterfly leave the leaf:
    - A. To be safe from the lizard.
    - B. To escape the sticky web.
    - C. To fly down sunlit trails.
    - D. To fly to a greener leaf.

9. Before settlers came from France, the natural swamp ecosystem
    - A. had not changed much.
    - B. had changed a lot.
    - C. had been cleared of trees.
    - D. no longer remained.

10. When settlers came from France, plants that were a part of the natural food chains were
    - A. no longer grown on the land.
    - B. removed to make land for tree farms.
    - C. grown as large crops on the land.
    - D. pushed farther back into the forest.

11. The early town of New Orleans became a place

    A. to make cloth.
    B. to trade goods.
    C. to recycle cotton.
    D. to manufacture steel.

12. The natural ecosystem of the area was changed by

    A. using large rafts.
    B. planting cypress and pine trees.
    C. sending ships to Europe.
    D. cutting trees for lumber.

13. What helped New Orleans to become a center for trading?

    A. Good roads made travel easy.
    B. It is close to the ocean and to a large river.
    C. It is near a large lake and the ocean.
    D. It is near two large rivers.

14. The earliest manufacturing industries used products

    A. brought there on sailing ships.
    B. raised by the Tunicans.
    C. of the forms and forests there.
    D. from Africa and the West Indies.

15. Machines are used to plow, plant and harvest crops. Large farms are owned by people who do not live on the farm. These details show that

    A. farming is now an industry.
    B. ways of traditional agriculture are used.
    C. machines do not upset food chains.
    D. people are better farmers when they do not live on the farm.

16. Indians and early settlers farmed and fished. They used wood and moss. Indians and settlers took only what they needed for themselves from the environment. People today take
    - A. as much as they can consume at home.
    - B. care not to upset or break any natural food chains.
    - C. only a little from the environment.
    - D. much more than they need from the environment.

17. Something that is polluted is
    - A. unhappy.
    - B. unclean.
    - C. unusual.
    - D. unuseful.

18. Very soft and spongy soil is called
    - A. hammaca.
    - B. sod.
    - C. clay.
    - D. peat.

19. Why were more swamps drained?
    - A. people needed to build on dry land.
    - B. People were trying to drive out the raccoons.
    - C. Levees could not keep swamp water out of the city.
    - D. People needed to build pipelines.

20. New Orleans would fill up with water without
    - A. boats, rafts, and sailing ships.
    - B. hoses, hydrants and pumps.
    - C. hammocks, hills and sewage treatment plants.
    - D. pumps, pipes and canals.

21. What must people do to have jobs and land on which to build and also have air and water?
    - A. Leave the natural ecosystem alone.
    - B. Learn how to build better homes and factories.
    - C. Try to cause little damage while using the land, air and water.
    - D. Use the land, air and water more because people need jobs.

22. The reason for "environmental impact" statements is to
    - A. tell planners where to build pumps and canals.
    - B. prevent a lot of damage to the environment.
    - C. help planners change things back to a natural environment.
    - D. prevent planners from changing the environment.

23. The "clear picture" or idea people have of New Orleans is of
    - A. marching troops, guns and planes.
    - B. air and water pollution, levees and large pumps.
    - C. French, Germans, Italians, Spanish and Blacks.
    - D. shiny floats, dancing feet and marching jazz bands.

24. A religious custom of the French before Ash Wednesday was to celebrate with
    - A. prayers, hymns, and fasting.
    - B. costume parties, marches and dances.
    - C. bullfights, speeches and long visits.
    - D. potluck dinners, folkdancing and prayer meetings.

25. What would you do on a banquette?
    - A. Sleep.
    - B. Ride
    - C. Walk.
    - D. Sit.

26. Hoodoo is a
    - A. spell.
    - B. dance.
    - C. song.
    - D. street.

27. People are less superstitious today because
    - A. they are not as close to the natural environment.
    - B. they are closer to the natural environment.
    - C. they do not like a polluted environment.
    - D. old beliefs are easy to throw out.

28. If you go to a doctor for a fever, you are probably not very

A. clever.

B. scientific.

C. ill.

D. superstitious.

APPENDIX F

I

DIRECTIONS TO TREATMENT GROUPS

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES

You will be reading a book with four sections, or parts. The first section of the book is about several different environments. An environment is all of the living and nonliving things found in a place. Plants and animals make up part of an environment. Weather, soil and minerals are part of the environment, too. The rest of the book will tell you how people live in each of three different environments.

How To Do The Activities

You will be doing some written activities while you read the book. An activity may ask you to choose or write an answer. Other activities will ask you to draw a picture of something.

Turn to page i of the reader. Take time right now to read this introduction titled Life in Ecosystems on pages i and ii.

Now turn to page 1 of the reader which is after the picture of the pond. Fold your reader back so that only page 1 is in front of you. You will see line-markers on the right side of the page with numbers next to the lines. Open your activity booklet to page 1. Place the activity booklet next to page 1 of the reader. In your reader you will see linemarkers on the right side of the page with numbers next to the lines. These markers show you where to find the information you will need to do the activities. Each marker number in the book matches the number of an activity. Begin reading in the reader. Read until you have finished reading through the section marked by the number 1. Look at activity 1 in your activity booklet. Read again the information inside the linemarker 1. Write an answer for activity 1. Do all of the activities in this way. Read first and then read and do the activity.

Be sure to read every sentence. If you come to a word you do not know, raise your hand. Someone will help you with the pronunciation. You may look up words in the dictionary. If you can't figure out something, go on to the next activity. Start with the introduction to Life in Ecosystems. There are no activities for the introduction. Then begin to read about the pond. When you have finished activities 2 and 3, raise your hand. Someone will check your answers to see that you understand the directions.

You will have six days of class in which to complete the first section of the book. Then you will be given a test to see how well you understand what you read. Do not begin to read the next section of the book until you are told to do so. You may read your library book if you finish early. You may review the directions while you work by looking at this chart.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES

The next section of the book that you will be reading is about a desert environment. This environment is the Kalahari desert in Africa. It is the home of people we call Bushmen. The Bushmen hunt animals and gather food such as fruits and nuts in this environment. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES

The next section of the book that you will be reading is about a tropical environment. This environment is the island of Java. It is the home of Javanese people who are rice farmers. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES

The last section of the book is about a subtropical environment. This environment is not as hot or as wet as the tropical environment of Java. This subtropical environment is the city of New Orleans in the United States. New Orleans is the home of people who use the environment for industry. In industry, people use machines to make new things from the plants, minerals and other things in the environment. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES AND CHECK ANSWERS

You will be reading a book with four sections, or parts. The first section of the book is about several different environments. An environment is all of the living and nonliving things found in a place. Plants and animals make up part of an environment. Weather, soil and minerals are part of the environment, too. The rest of the book will tell you how people live in each of three different environments.

How To Do The Activities

You will be doing some written activities while you read the book. An activity may ask you to choose or write an answer. Other activities will ask you to draw a picture of something.

Turn to page i of the reader. Take time right now to read this introduction titled Life in Ecosystems on page i and ii.

Now turn to page 1 of the reader which is after the picture of the pond. Fold your reader back so that only page 1 is in front of you. You will see line-markers on the right side of the page with numbers next to the lines. Open your activity booklet to page 1. Place the activity booklet next to page 1 of the reader. In your reader you will see linemarkers on the right side of the page with numbers next to the lines. These markers show you where to find the information you will need to do the activities. Each marker number in the book matches the number of an activity. Begin reading in the reader. Read until you have finished reading through the section marked by the number 1. Look at activity 1 in your activity booklet. Read again the information inside the linemarker 1. Write an answer for activity 1. Do all of the activities in this way. Read first and then read and do the activity.

How To Check Your Answers

Open your Answer Key and fold back the cover. Read the answer for activity 1. You will see that there is only one way to answer part a. For part b, you had to write something in your own words. The answer in the Answer Key for part b is called a sample answer. A sample answer tells you what your answer might say.

Be sure to read every sentence. If you come to a word you do not know, raise your hand. Someone will help you with the pronunciation. You may look up words in the dictionary. If you can't figure out something, go on to the next activity. Start with the introduction to Life in Ecosystems. There are no activities for the introduction. Then begin to read about the pond. When you have finished activities 2 and 3, raise your hand. Someone will check your answers to see that you understand the directions.

You will have six days of class in which to complete the first section of the book. Then you will be given a test to see how well you understand what you read. Do not begin to read the next section of the book until you are told to do so. You may read your library book if you finish early. You may review the directions while you work by looking at this chart.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES AND CHECK ANSWERS

The next section of the book that you will be reading is about a desert environment. This environment is the Kalahari desert in Africa. It is the home of people we call Bushmen. The Bushmen hunt animals and gather food such as fruits and nuts in this environment. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES AND CHECK ANSWERS

The next section of the book that you will be reading is about a tropical environment. This environment is the island of Java. It is the home of Javanese people who are rice farmers. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR STUDENTS WHO WILL DO ACTIVITIES AND CHECK ANSWERS

The last section of the book is about a subtropical environment. This environment is not as hot or as wet as the tropical environment of Java. This subtropical environment is the city of New Orleans in the United States. New Orleans is the home of people who use the environment for industry. In industry, people use machines to make new things from the plants, minerals and other things in the environment. Work carefully. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR READING

You will be reading a book with four sections, or parts. The first section of the book is about several different environments. An environment is all of the living and nonliving things found in a place. Plants and animals make up part of an environment. Weather, soil and minerals are part of the environment, too.

The rest of the book will tell you how people live in each of three different environments. Read carefully. If you come to a word you do not know, raise your hand and someone will help you with the pronunciation. You may look up words in the dictionary, too. You will have six days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin to read the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR READING

The next section of the book that you will be reading is about a desert environment. This environment is the Kalahari desert in Africa. It is the home of people we call Bushmen. The Bushmen hunt animals and gather food such as fruits and nuts in this environment.

Read carefully. If you come to a word you do not know, raise your hand and someone will help you with the pronunciation. You may look up words in the dictionary, too. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin to rea d the next section of the book until you are told to do so. You may read your library book if you finish early.

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Read carefully. If you come to a word you do not know, raise your hand and someone will help you with the pronunciation. You may look up words in the dictionary, too. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin to read the next section of the book until you are told to do so. You may read your library book if you finish early.

DIRECTIONS FOR READING

The last section of the book is about a subtropical environment. This environment is not as hot or as wet as the tropical environment of Java. This subtropical environment is the city of New Orleans in the United States. New Orleans is the home of people who use the environment for industry. In industry, people use machines to make new things from the plants, mineral and other things in the environment.

Read carefully. If you come to a word you do not know, raise your hand and someone will help you with the pronunciation. You may look up words in the dictionary, too. You will have four days of class in which to read this section. Then you will be given a test to see how well you understood what you read. Do not begin to read the next section of the book until you are told to do so. You may read your library book if you finish early.